OIPE JC139
MAR 10 2004
PATENT & TRADEMARK OFFICE

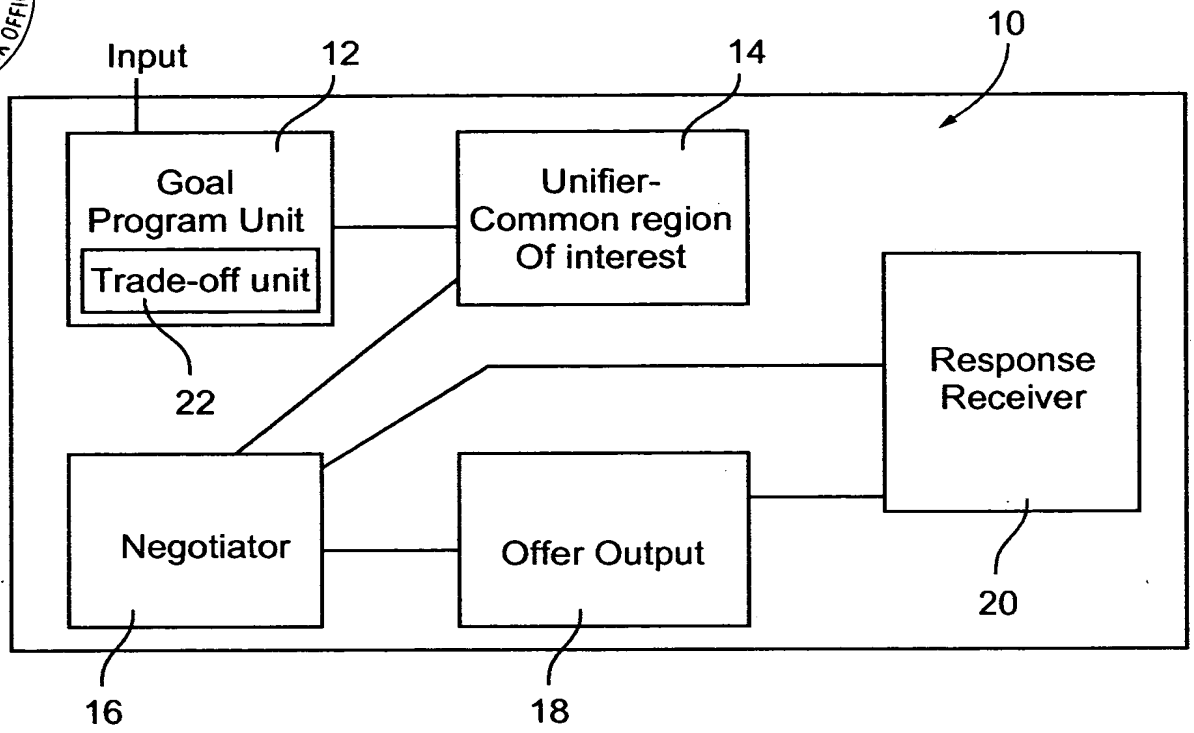


Fig. 1

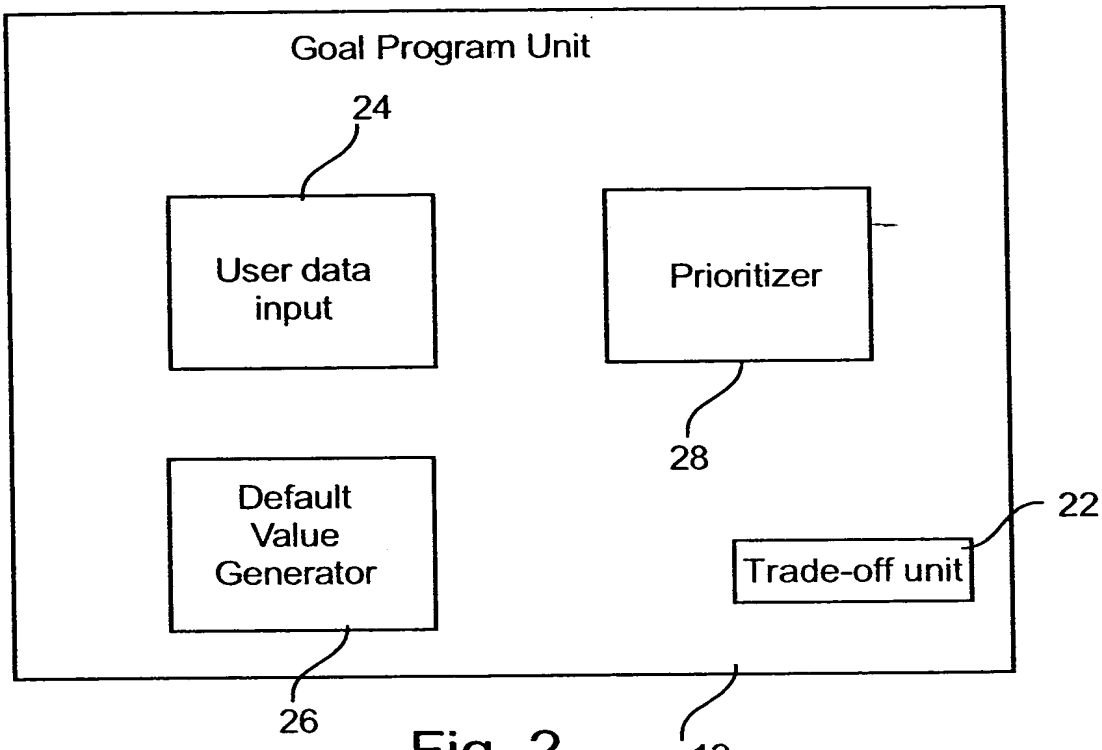

Goal Program Unit
24
User data input
Prioritizer
28
Default Value Generator
22
Trade-off unit
26
12

Fig. 2

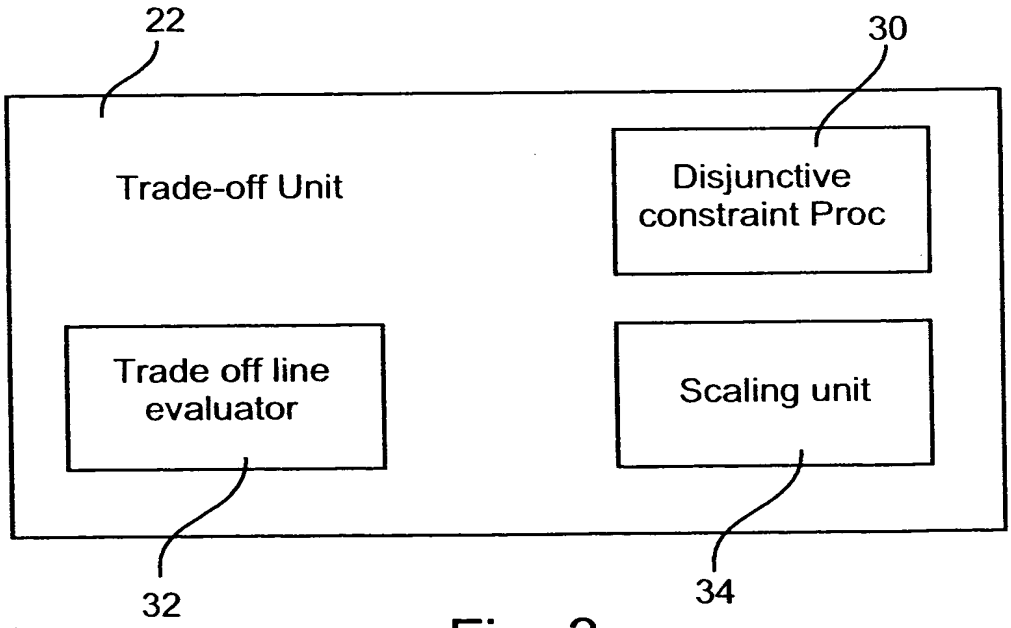

22
30
Trade-off Unit
Disjunctive constraint Proc
Trade off line evaluator
Scaling unit
32
34

Fig. 3

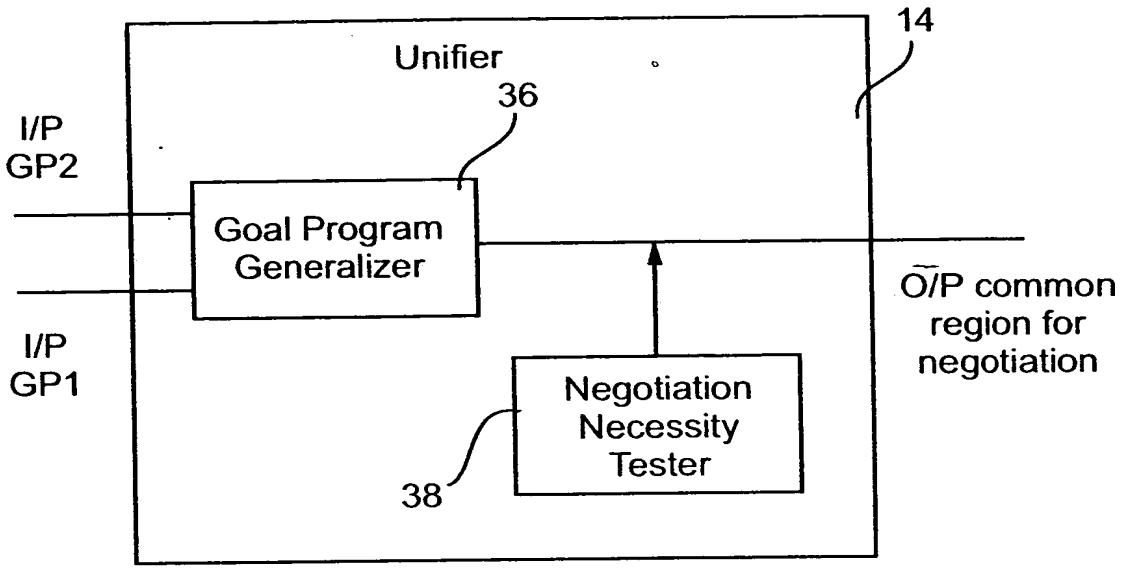

Unifier
14
36
I/P
GP2
Goal Program
Generalizer
I/P
GP1
O/P common
region for
negotiation
Negotiation
Necessity
Tester
38

Fig. 4

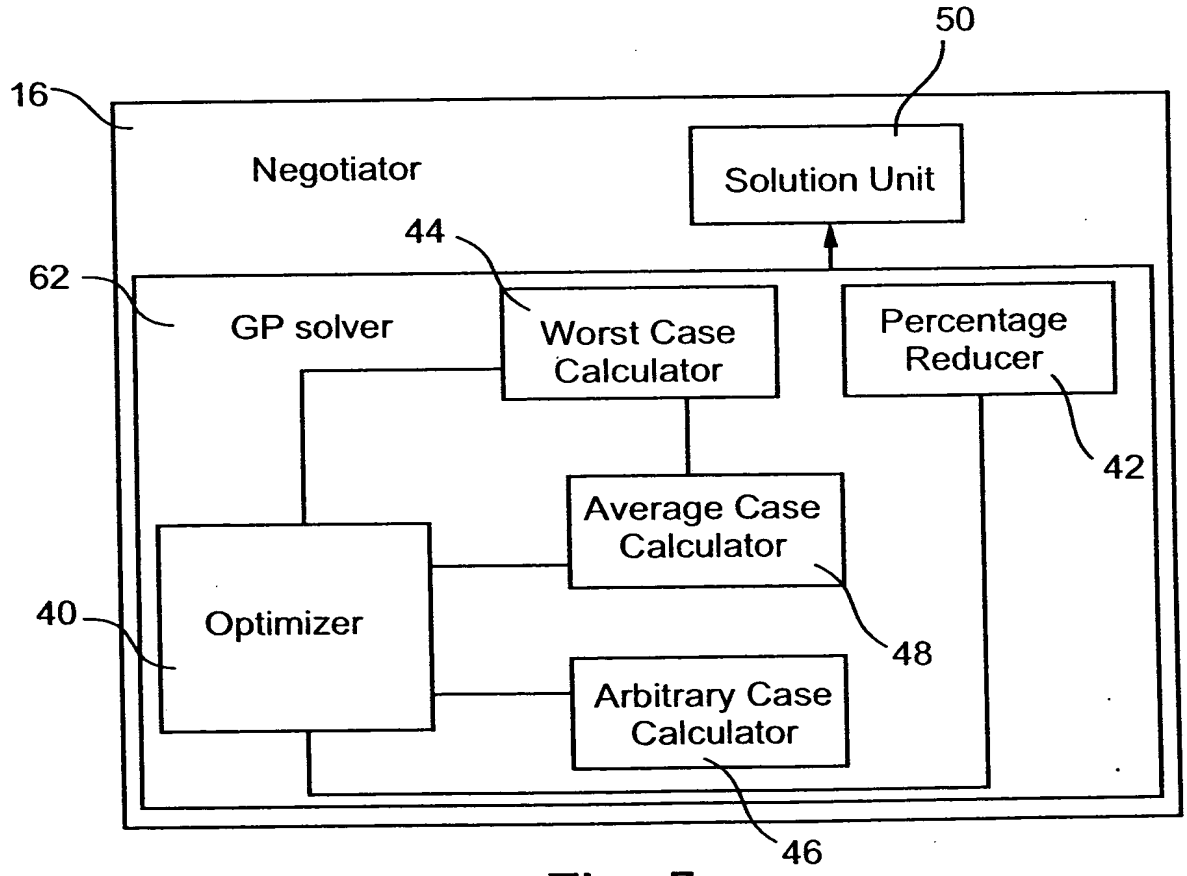

50
16
Negotiator
Solution Unit
44
62
GP solver
Worst Case
Calculator
Percentage
Reducer
42
Average Case
Calculator
Optimizer
40
48
Arbitrary Case
Calculator
46

Fig. 5

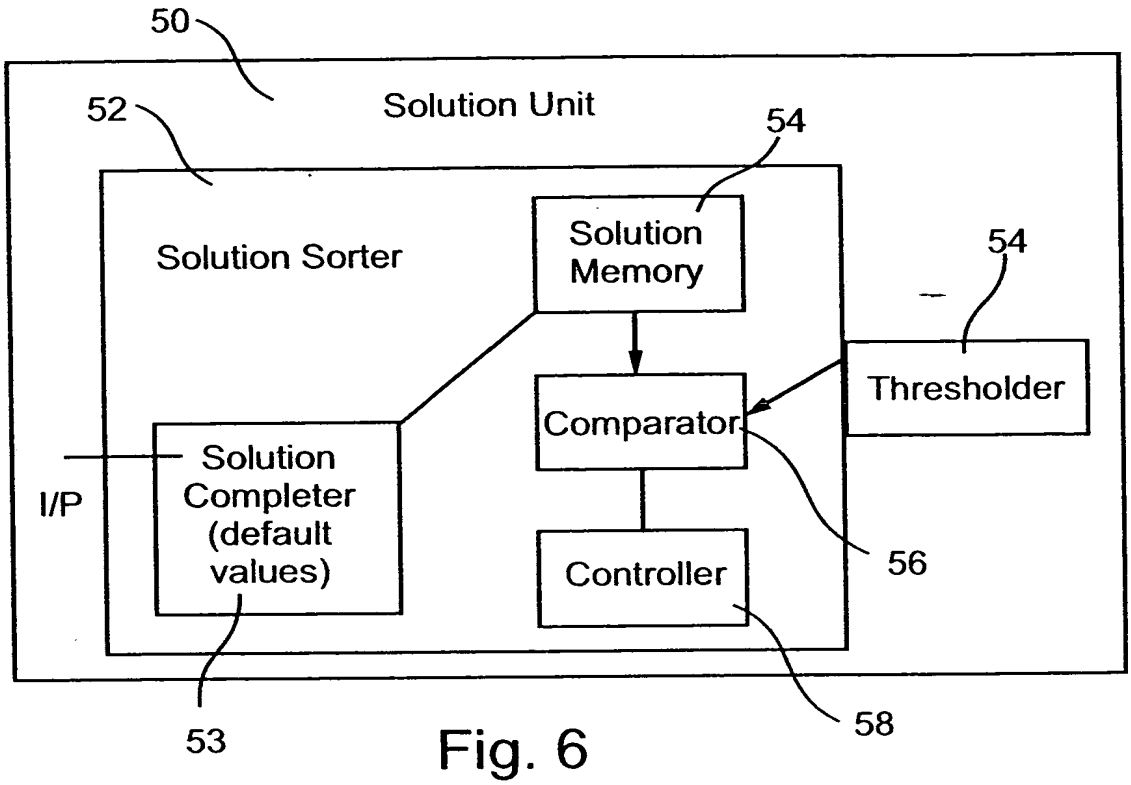

50
Solution Unit
52
54
Solution Sorter
Solution Memory
54
Thresholder
Comparator
I/P
Solution Completer (default values)
Controller
56
53
58

Fig. 6

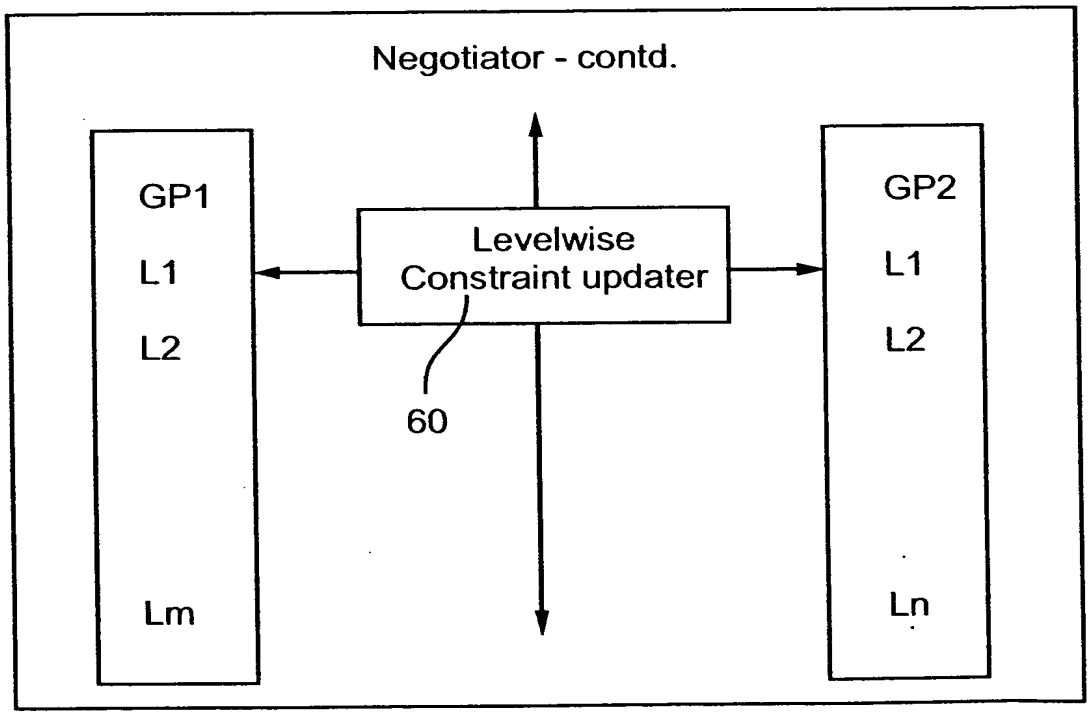

Negotiator - contd.
GP1
L1
L2
Lm
Levelwise Constraint updater
60
GP2
L1
L2
Ln

Fig. 7

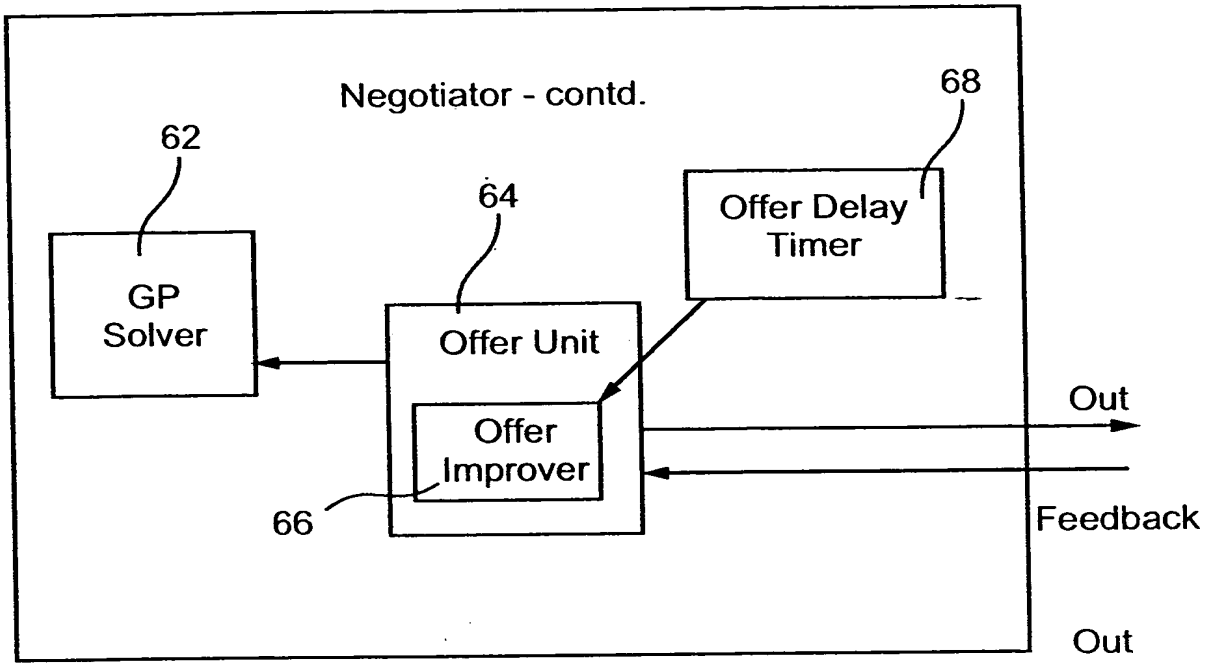

Negotiator - contd.
68
62
64
Offer Delay Timer
GP Solver
Offer Unit
Offer Improver
66
Out
Feedback
Out

Fig. 8

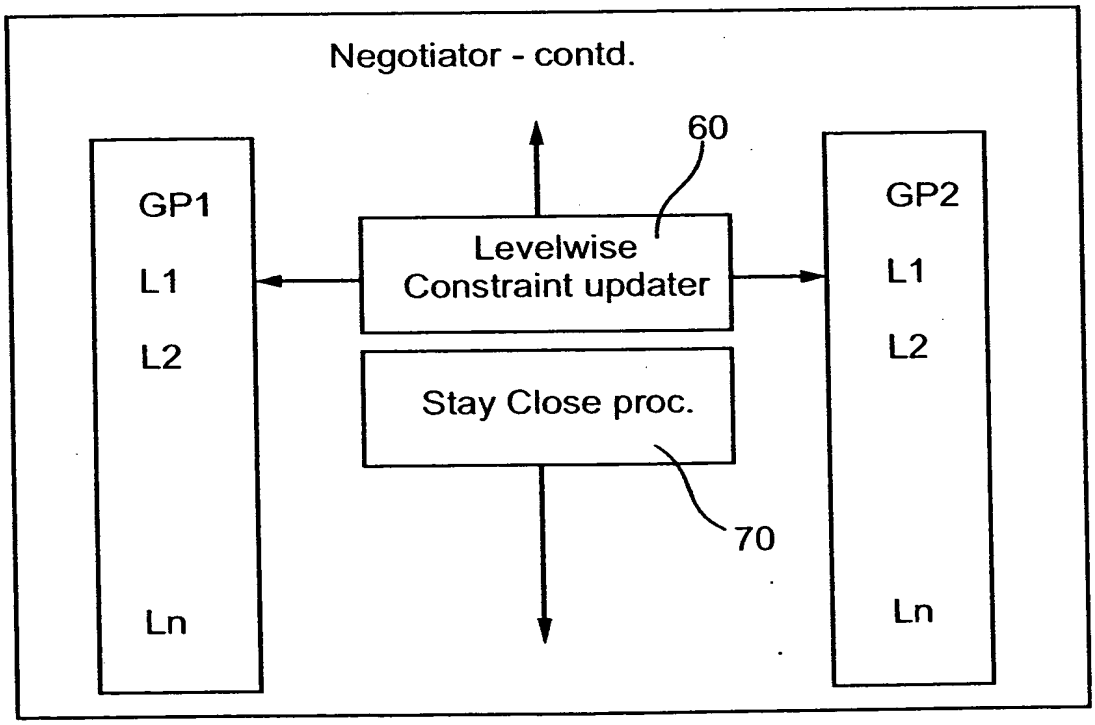

Negotiator - contd.
60
GP1
L1
L2
Ln
Levelwise Constraint updater
Stay Close proc.
70
GP2
L1
L2
Ln

Fig. 9

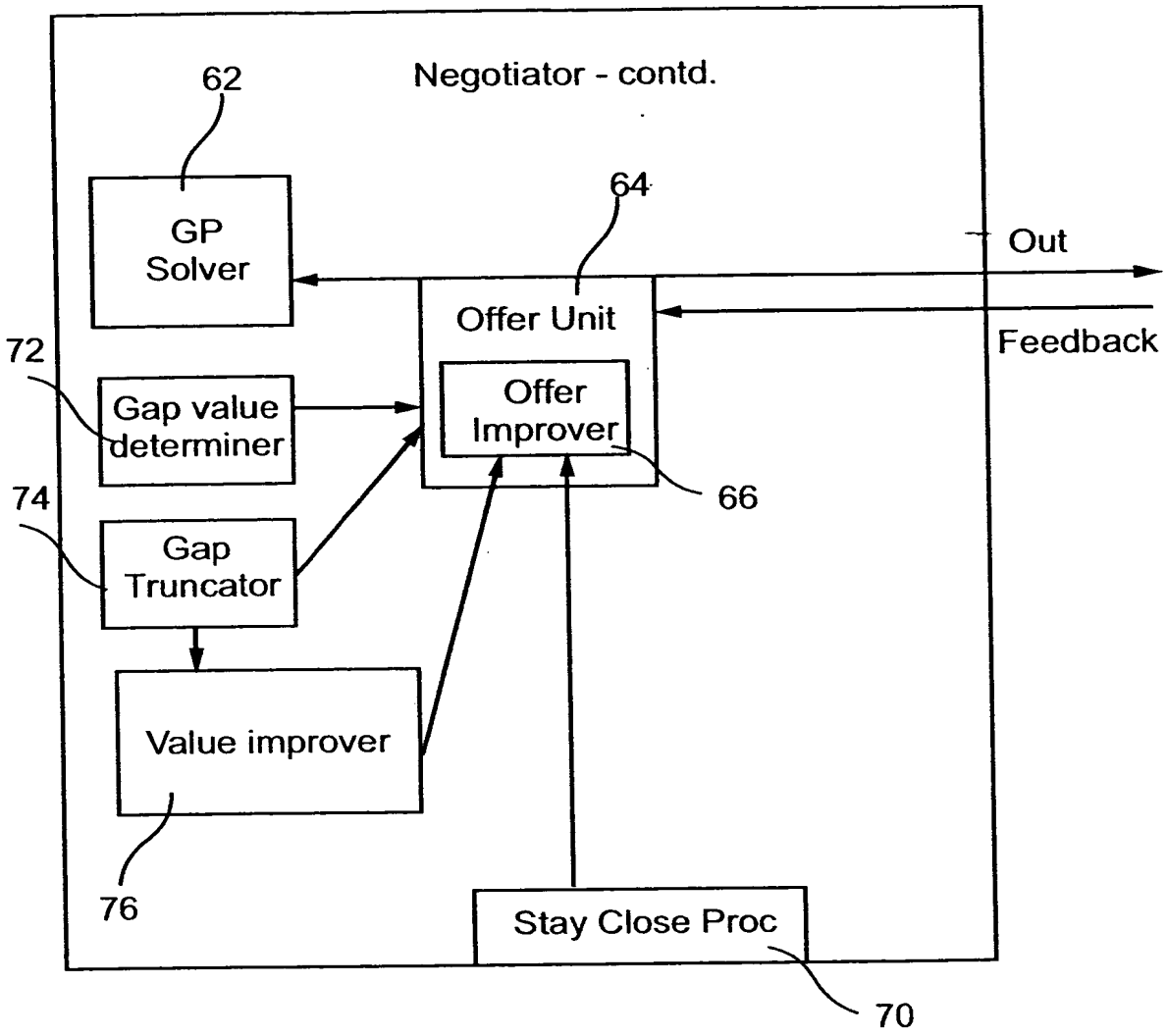

Negotiator - contd.
62
GP Solver
64
Out
Offer Unit
Feedback
72
Gap value determiner
Offer Improver
66
74
Gap Truncator
Value improver
76
Stay Close Proc
70

Fig. 10

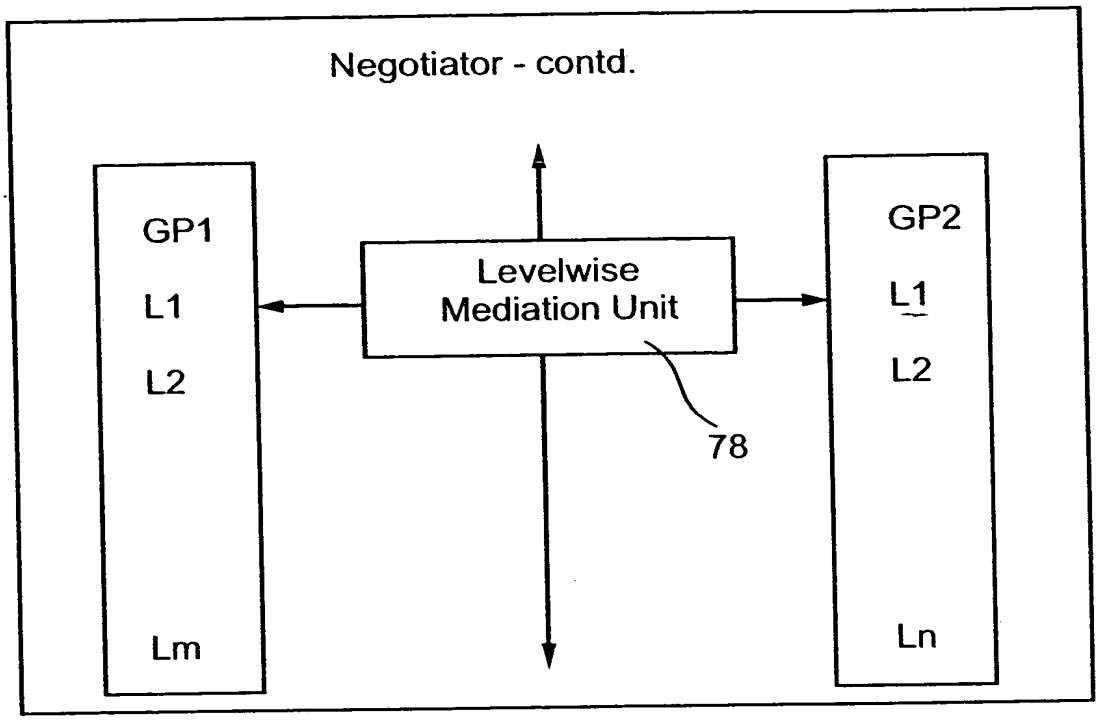

Negotiator - contd.
GP1
L1
L2
Lm
Levelwise Mediation Unit
78
GP2
L1
L2
Ln

Fig. 11

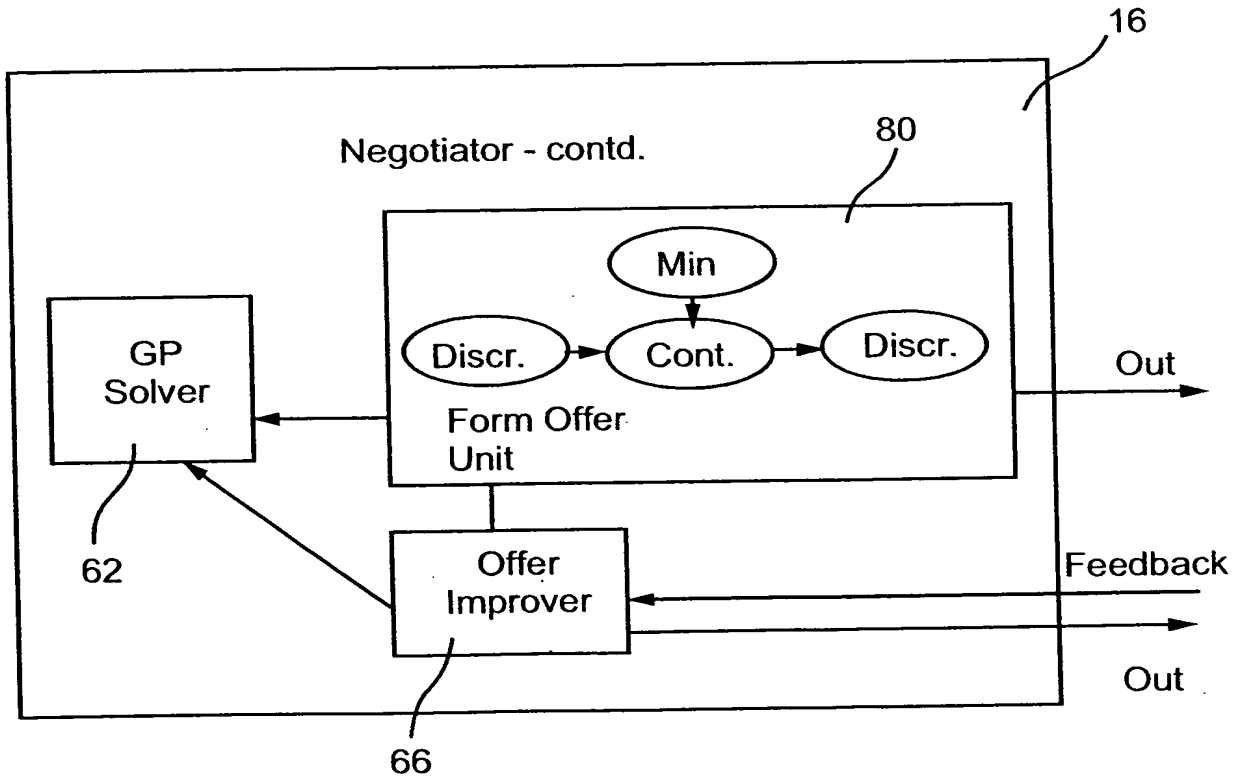

16
Negotiator - contd.
80
Min
Discr.
Cont.
Discr.
Out
GP Solver
Form Offer Unit
62
Offer Improver
Feedback
Out
66

Fig. 12

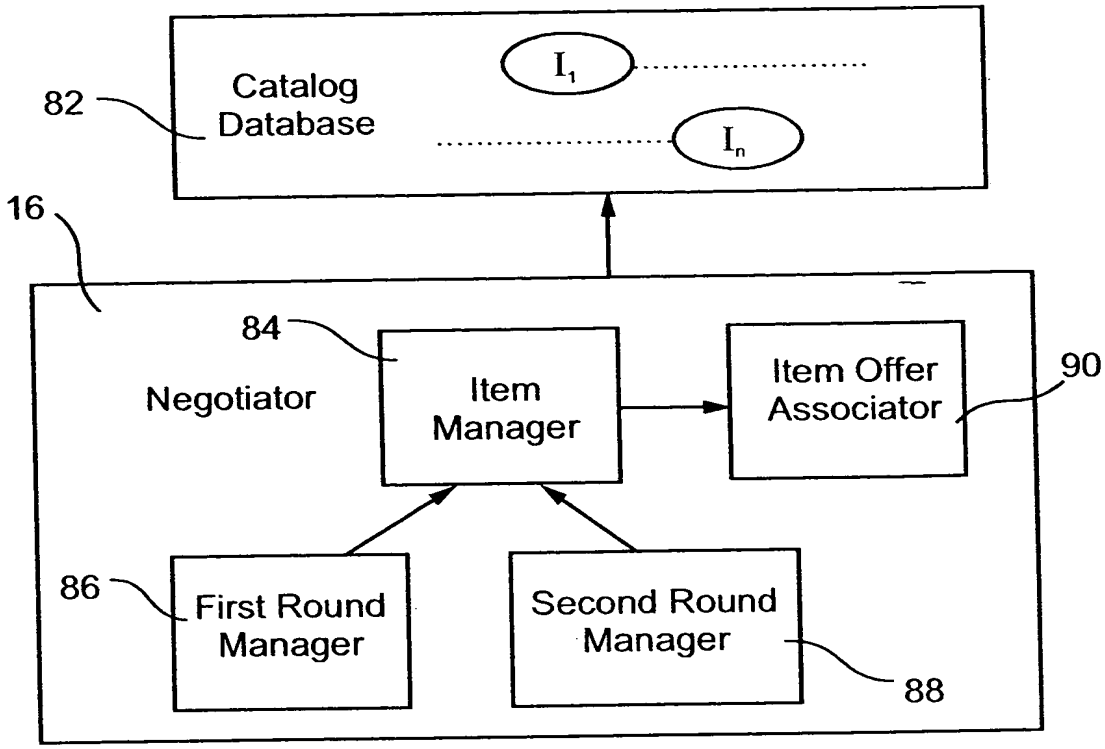

Catalog Database
82
I_1
I_n
16
84
Negotiator
Item Manager
Item Offer Associator
90
86
First Round Manager
Second Round Manager
88

Fig. 13

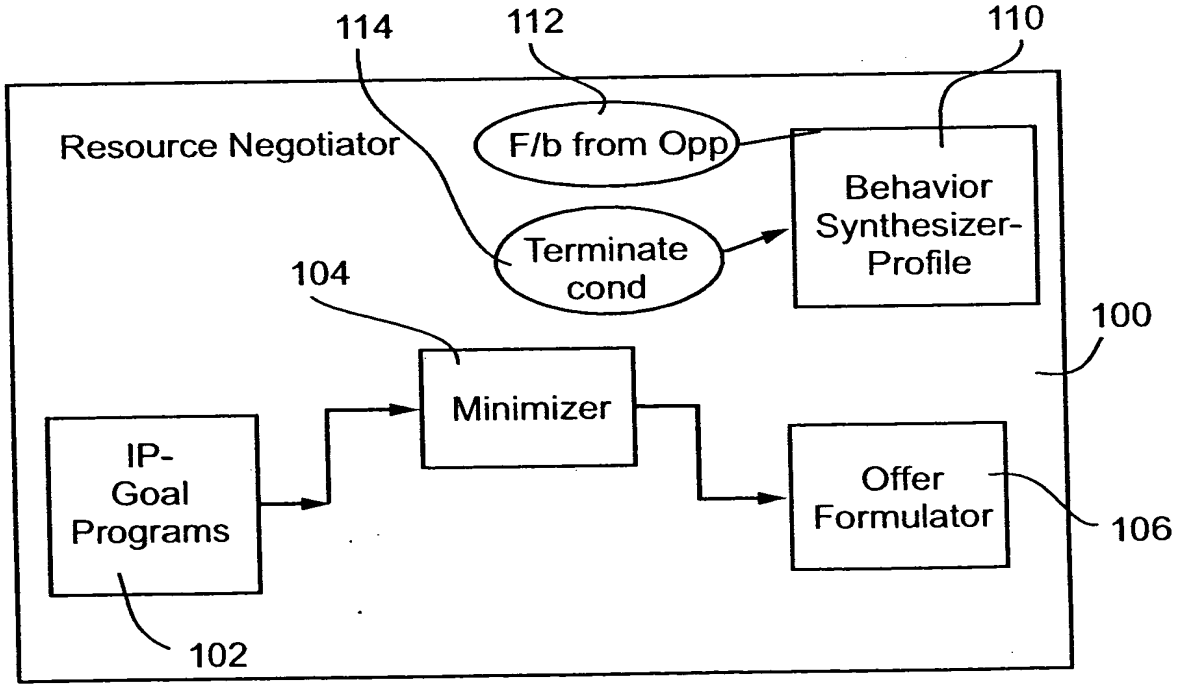

114
112
110
Resource Negotiator
F/b from Opp
Behavior Synthesizer-Profile
Terminate cond
104
100
Minimizer
IP-Goal Programs
Offer Formulator
106
102

Fig. 14

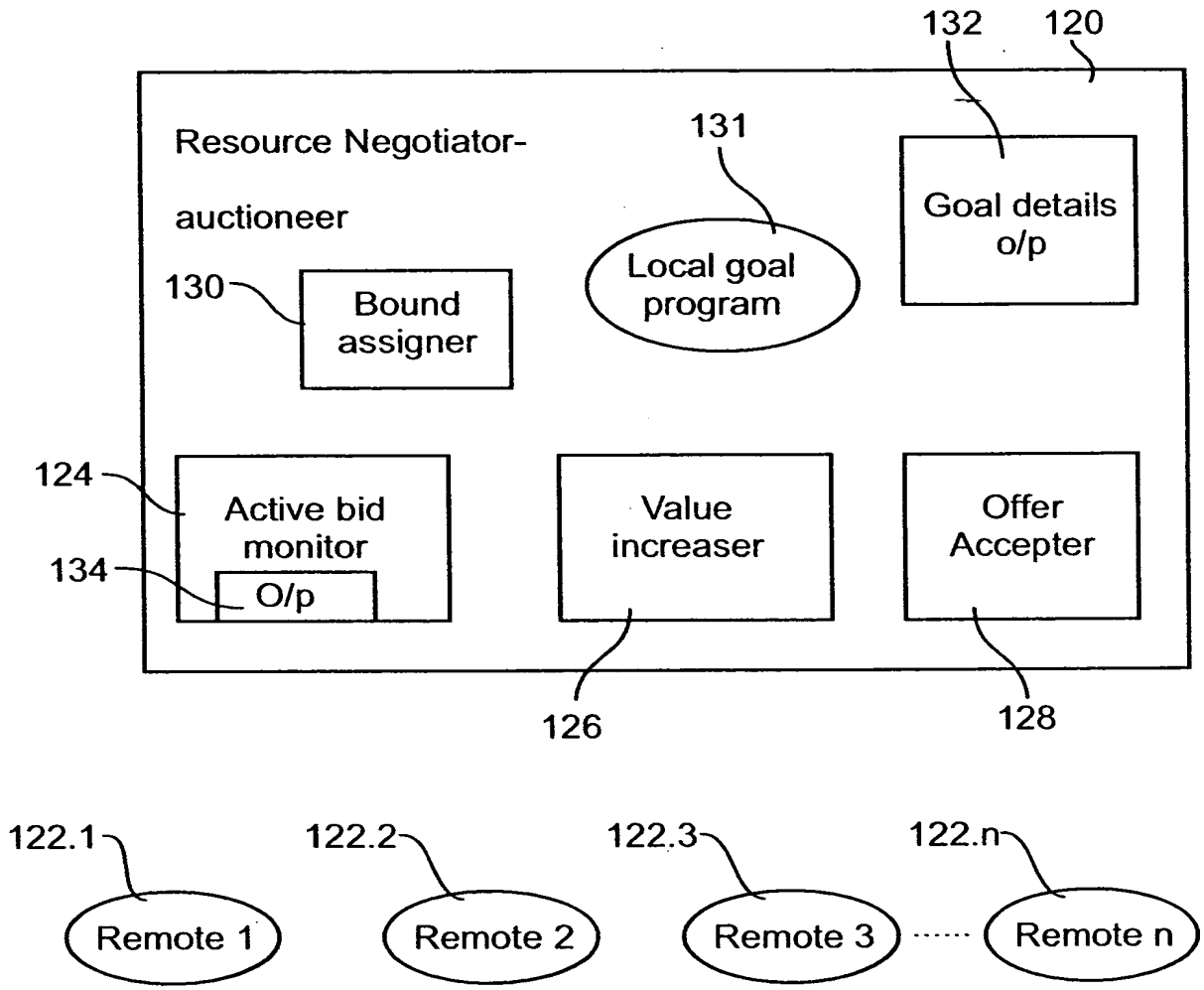

132
120
Resource Negotiator-
auctioneer
131
Goal details
o/p
Local goal
program
130
Bound
assigner
124
Active bid
monitor
134
O/p
Value
increaser
Offer
Accepter
126
128
122.1
122.2
122.3
122.n
Remote 1
Remote 2
Remote 3
Remote n

Fig. 15

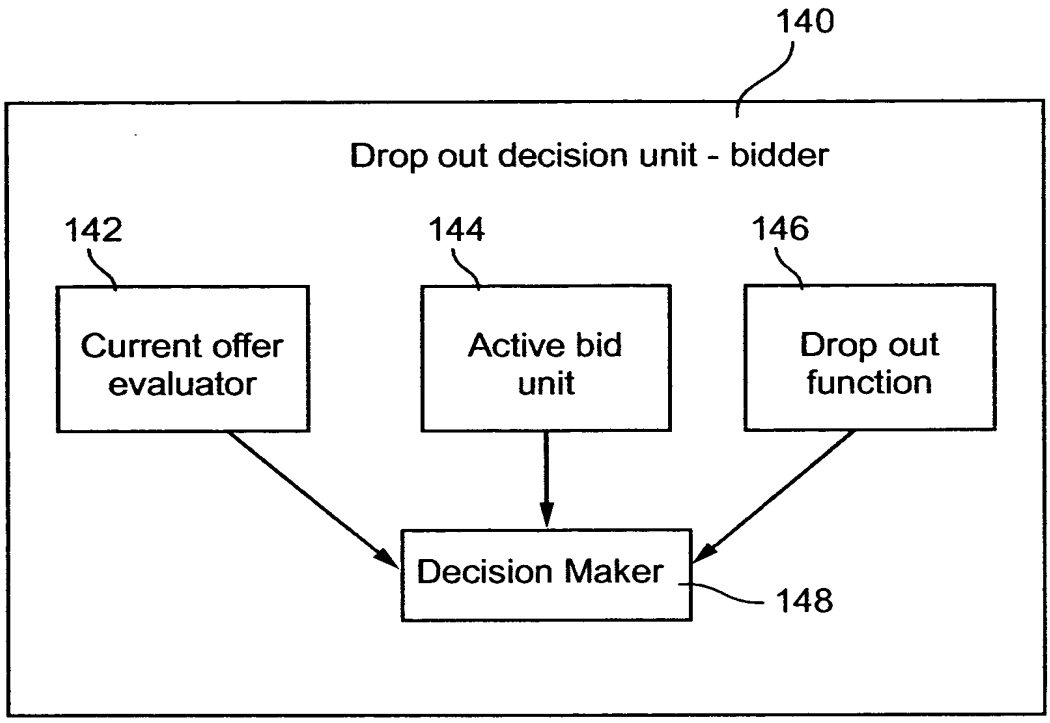


Fig. 16

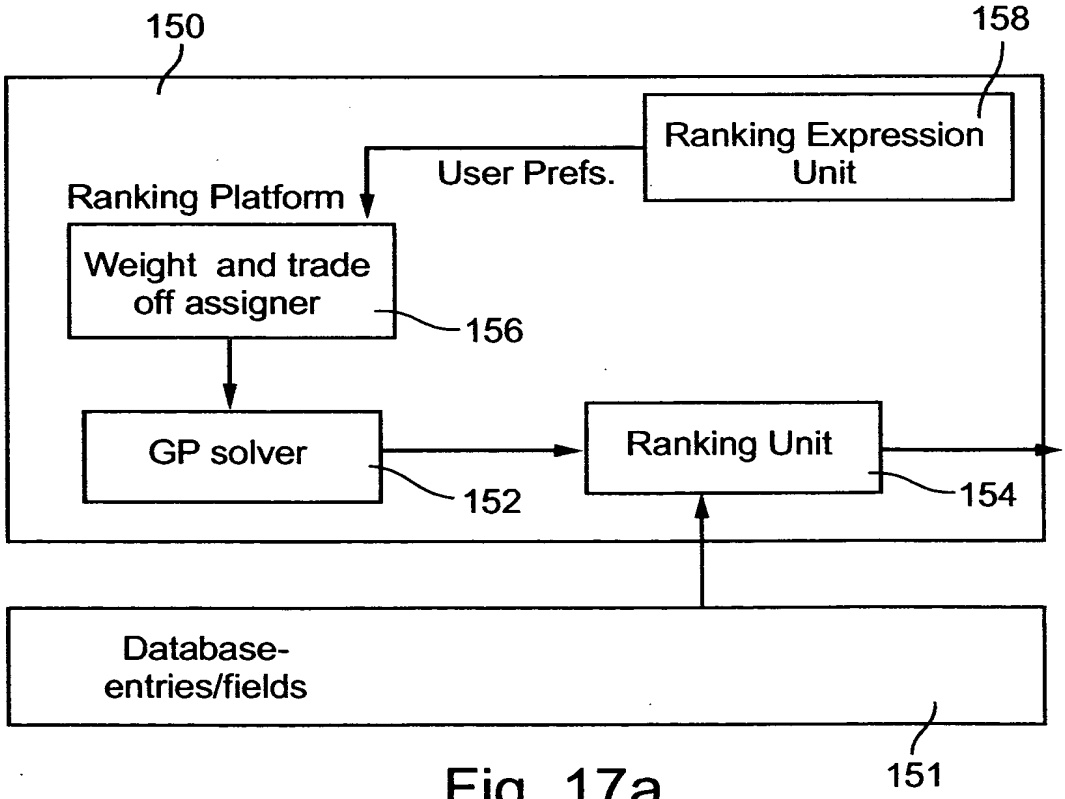


Fig. 17a

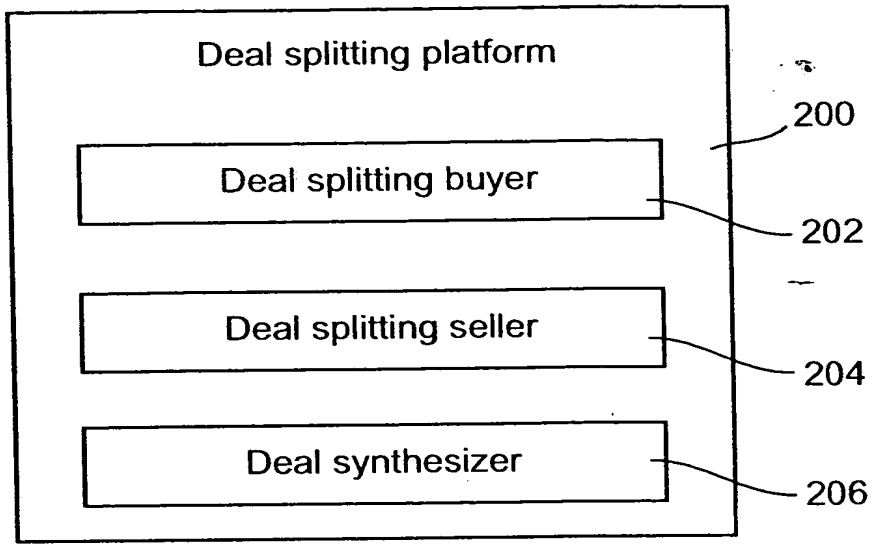


Fig. 17b

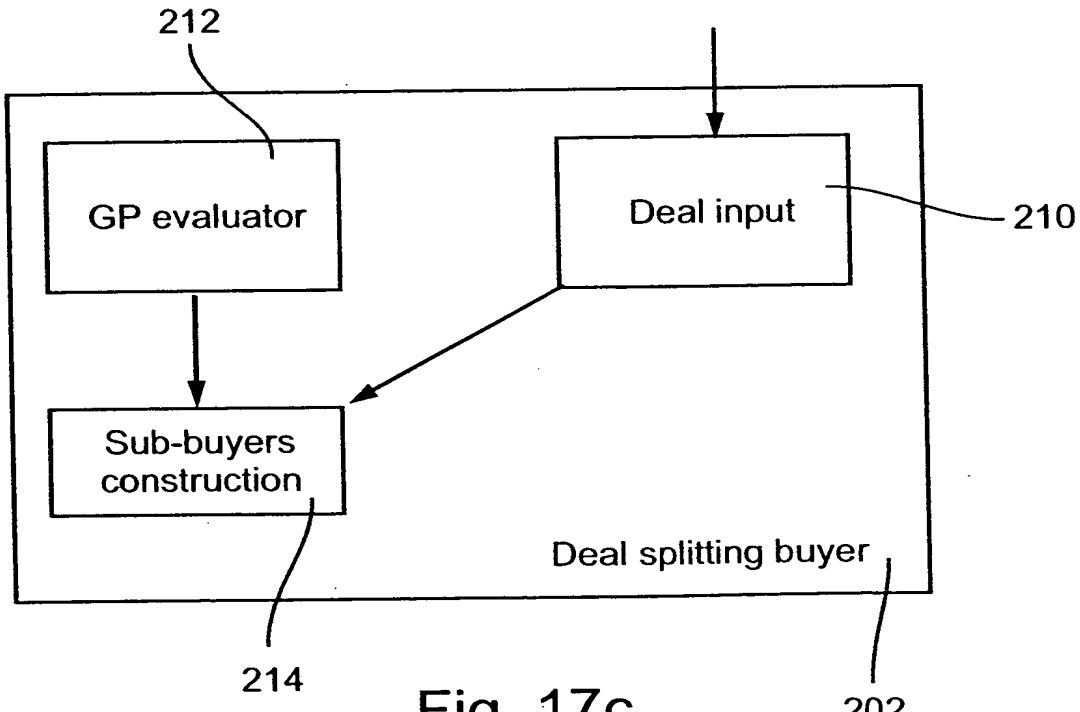


Fig. 17c

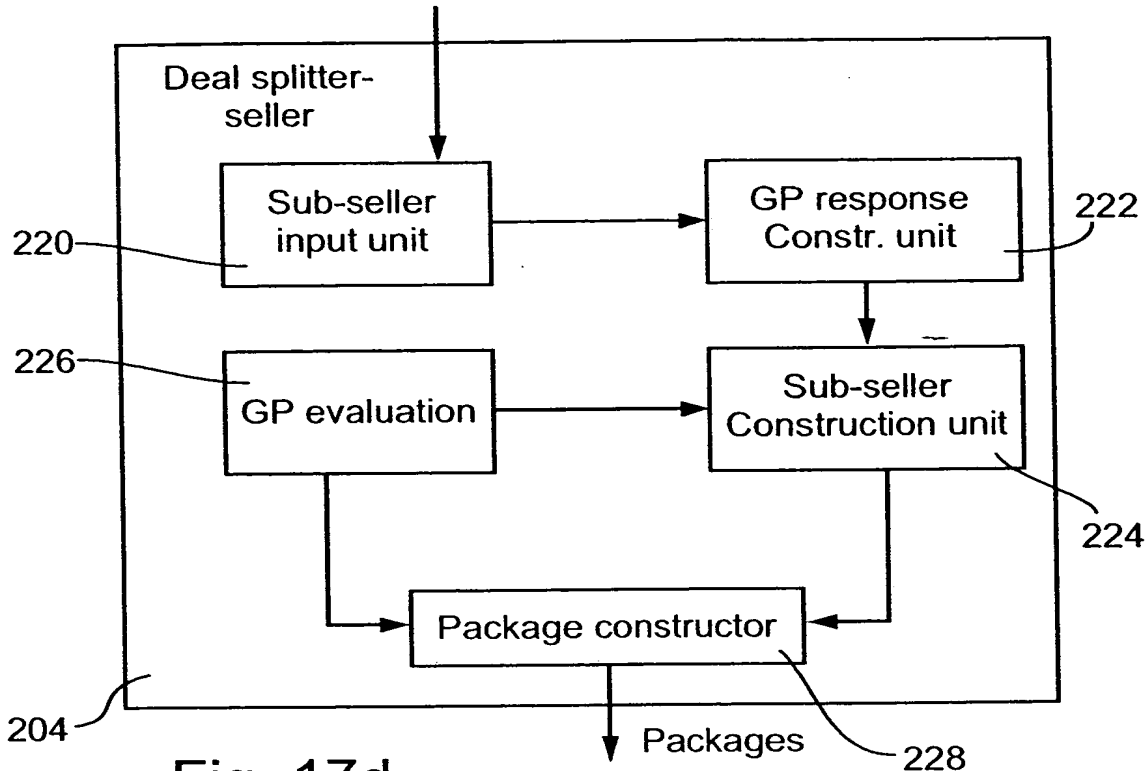


Fig. 17d

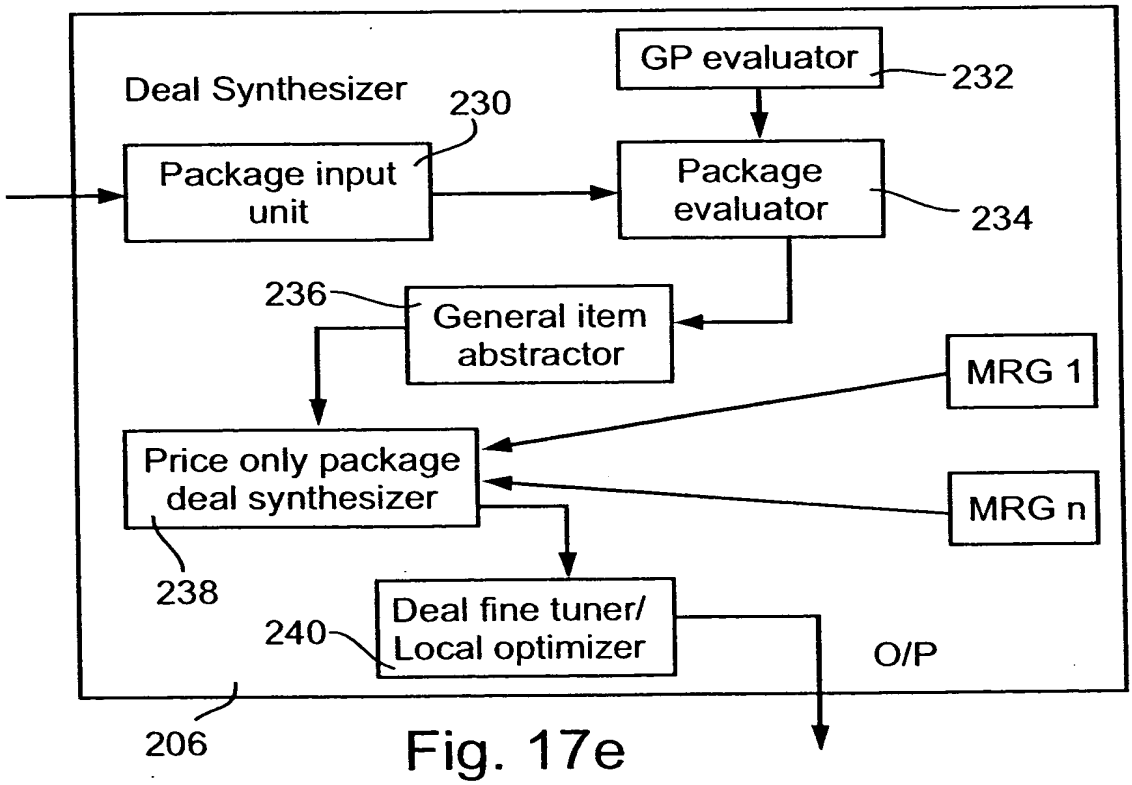


Fig. 17e

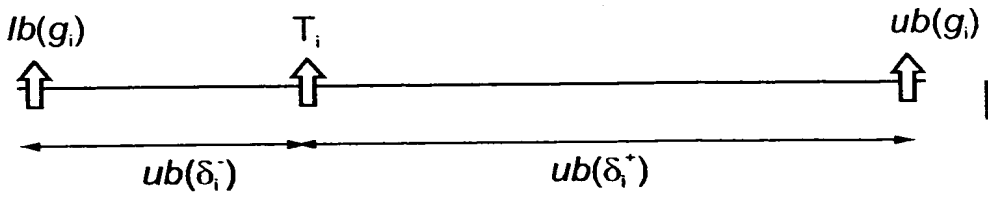


Fig. 18

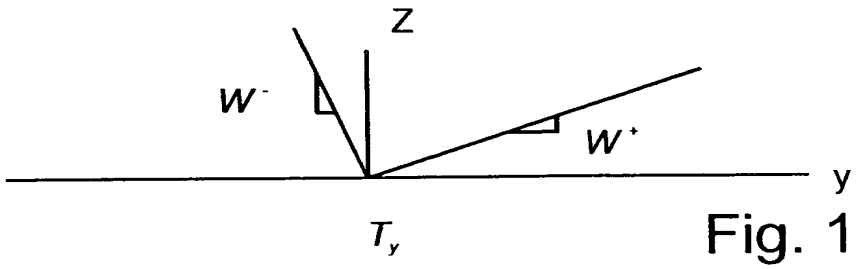


Fig. 19

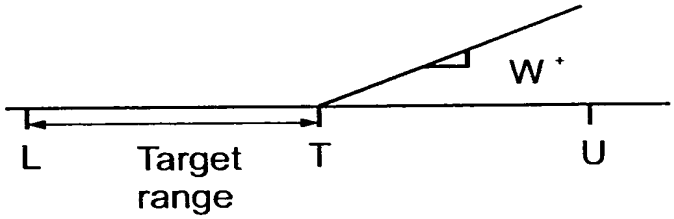


Fig. 20

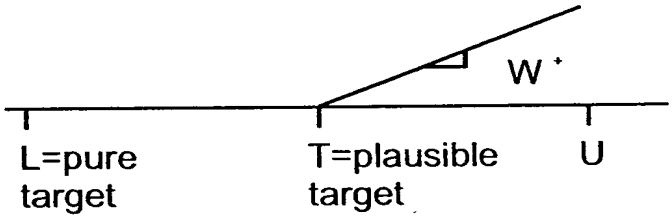


Fig. 21

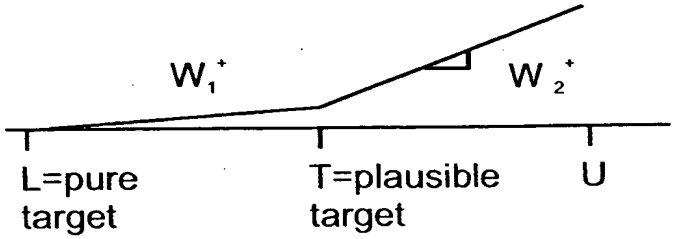


Fig. 22

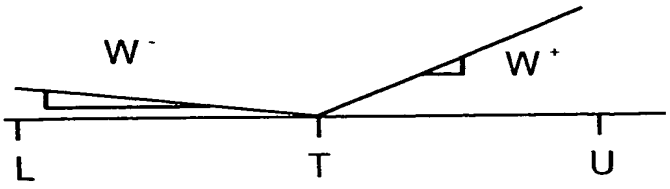


Fig. 23

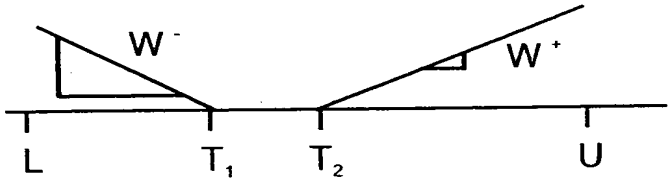


Fig. 24

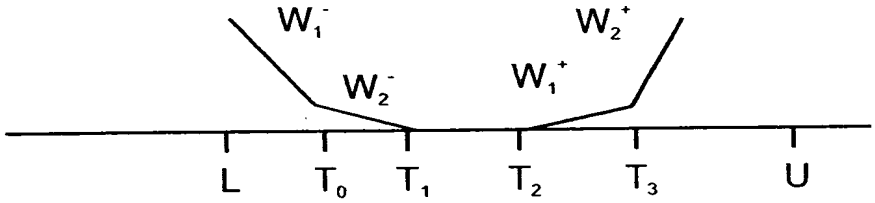


Fig. 25

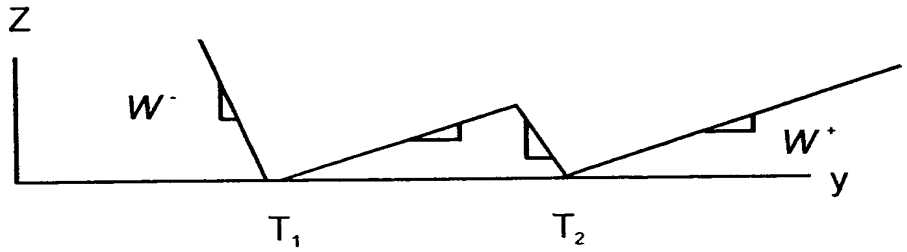


Fig. 26

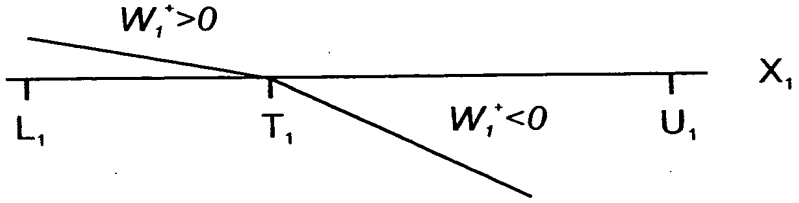


Fig. 27a

Fig. 27b

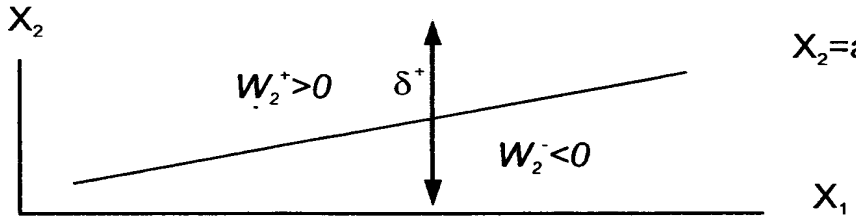


Fig. 27c

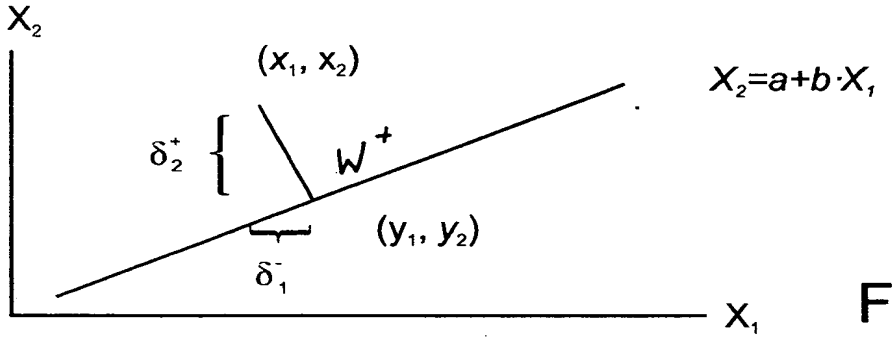


Fig. 27d

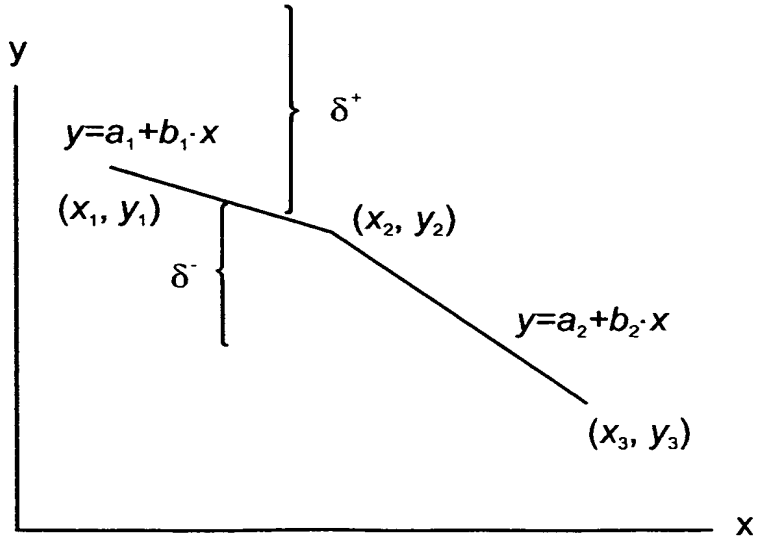


Fig. 28

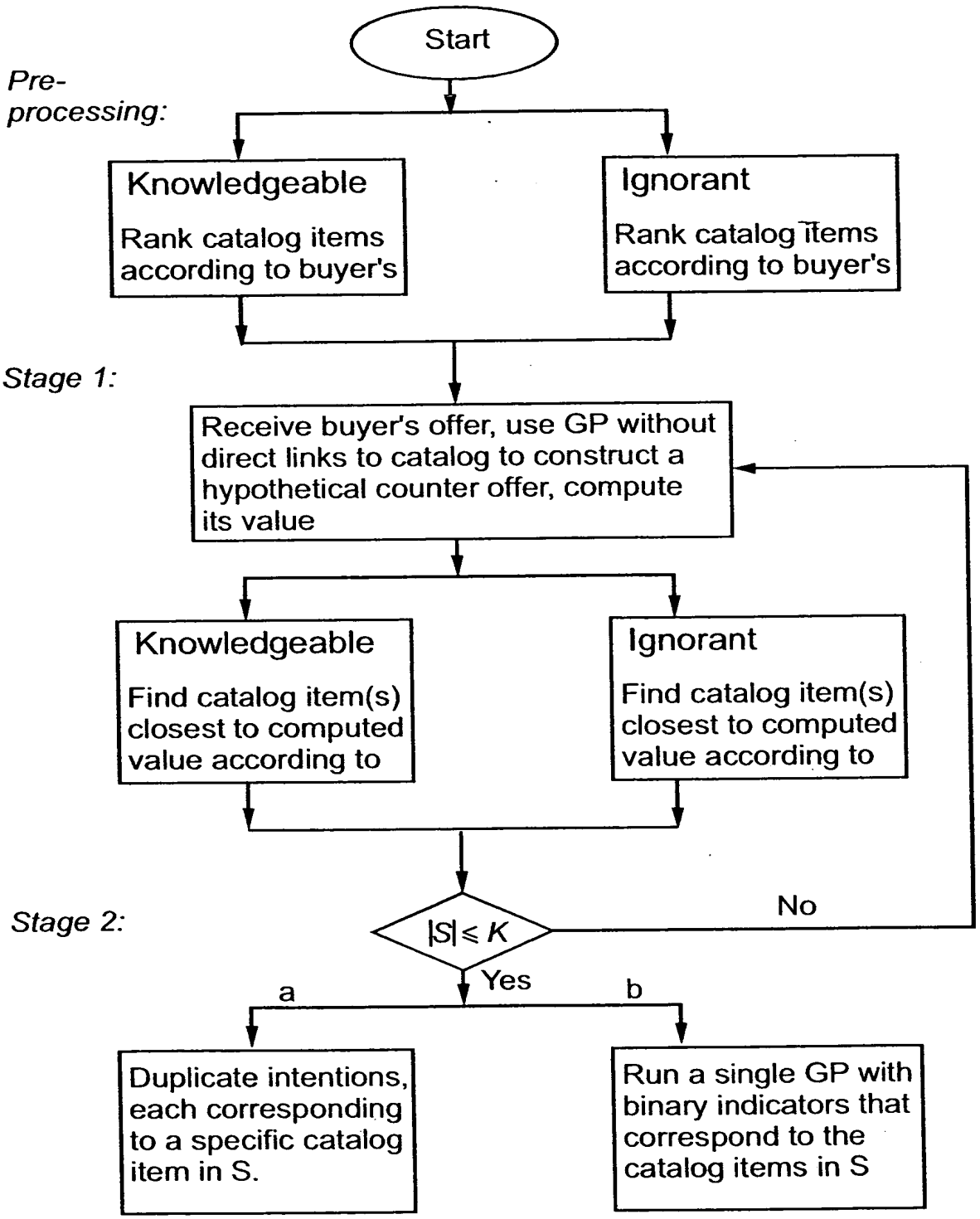

Start
Pre-processing:
Knowledgeable
Rank catalog items according to buyer's
Ignorant
Rank catalog items according to buyer's
Stage 1:
Receive buyer's offer, use GP without direct links to catalog to construct a hypothetical counter offer, compute its value
Knowledgeable
Find catalog item(s) closest to computed value according to
Ignorant
Find catalog item(s) closest to computed value according to
Stage 2:
|S| ≤ K
No
Yes
a
b
Duplicate intentions, each corresponding to a specific catalog item in S.
Run a single GP with binary indicators that correspond to the catalog items in S

Fig. 29

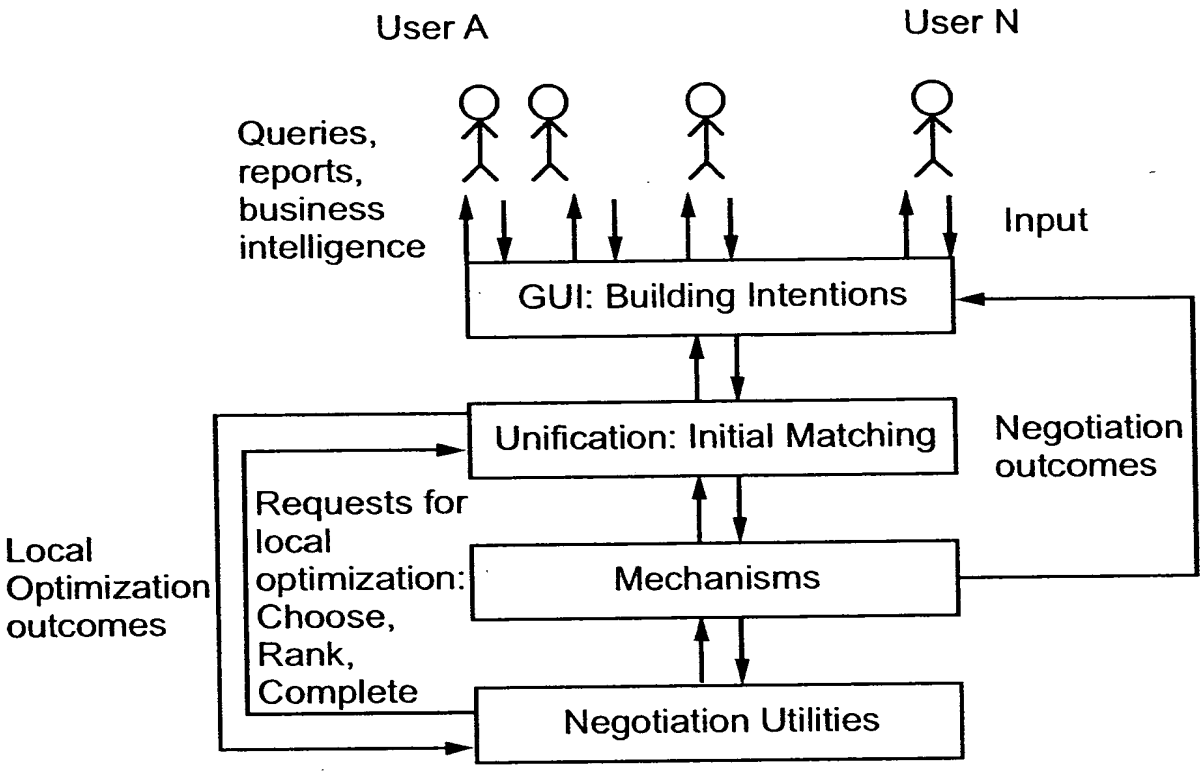

User A
User N
Queries, reports, business intelligence
Input
GUI: Building Intentions
Unification: Initial Matching
Negotiation outcomes
Requests for local optimization: Choose, Rank, Complete
Local Optimization outcomes
Mechanisms
Negotiation Utilities

Fig. 30

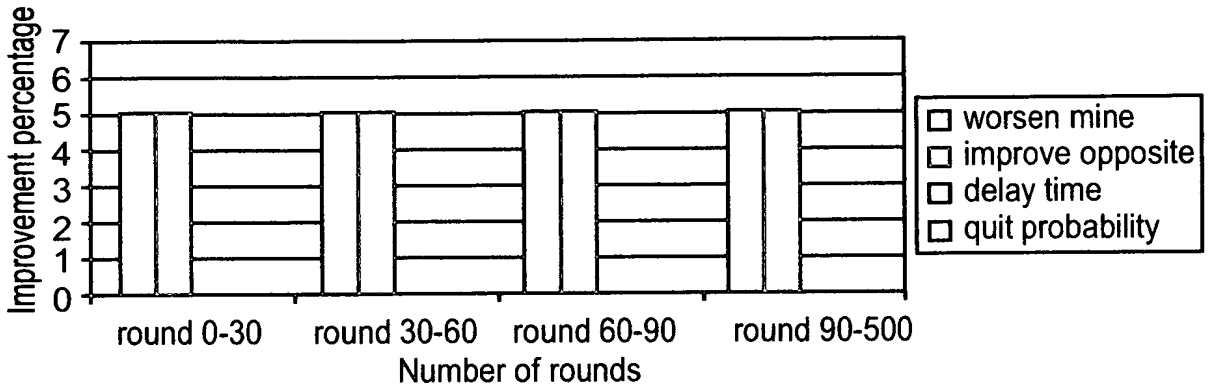


Fig. 31

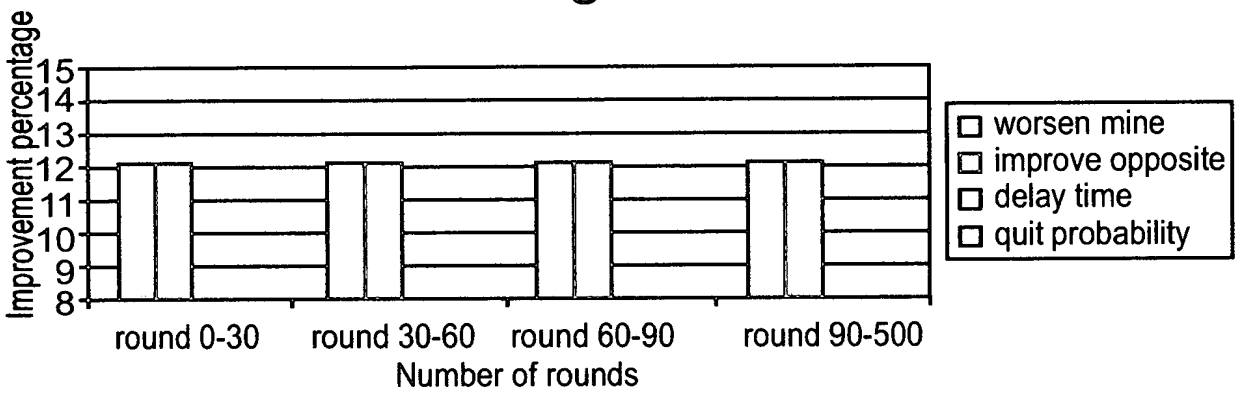


Fig. 32

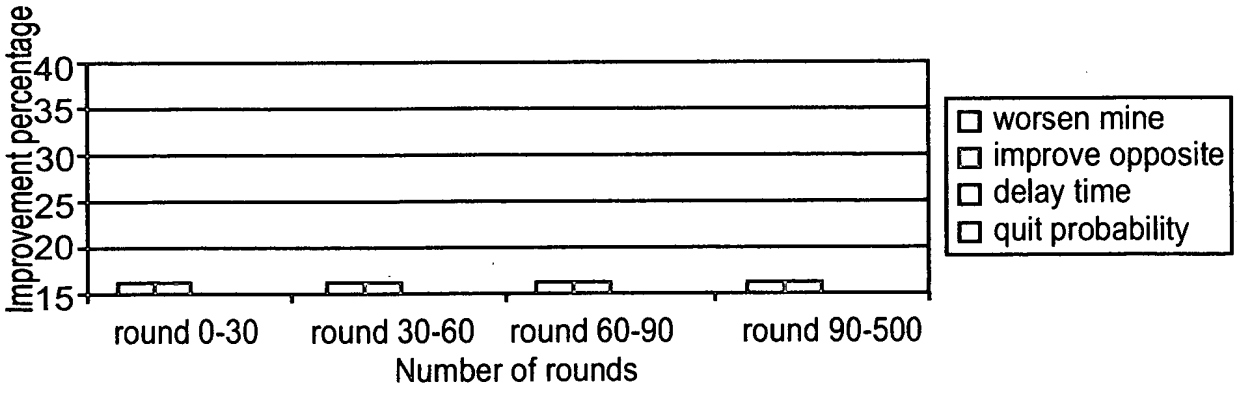


Fig. 33

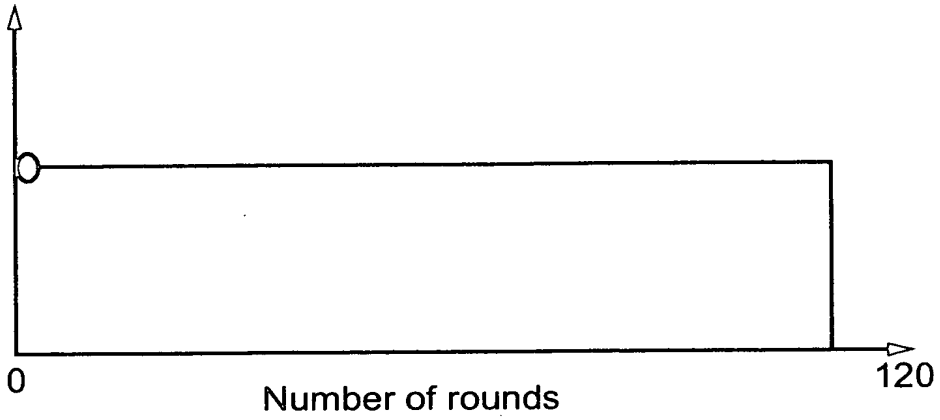


Fig. 34

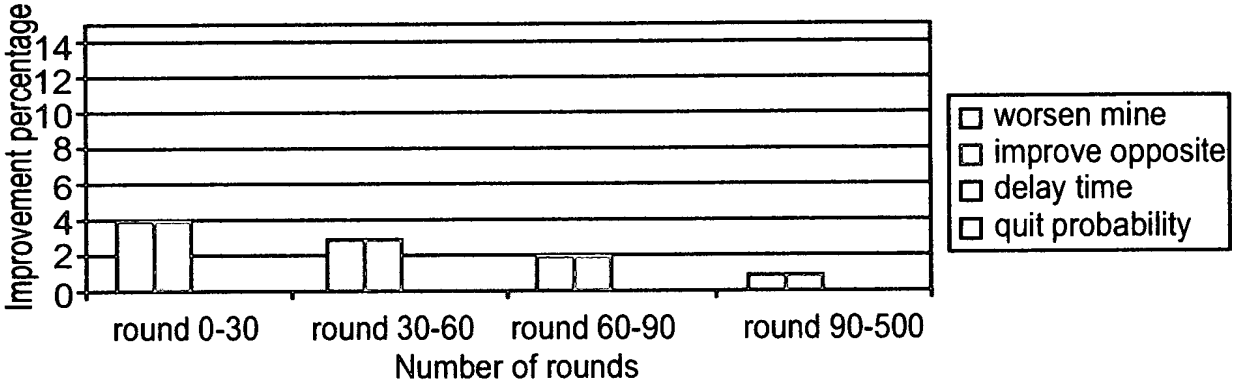


Fig. 35

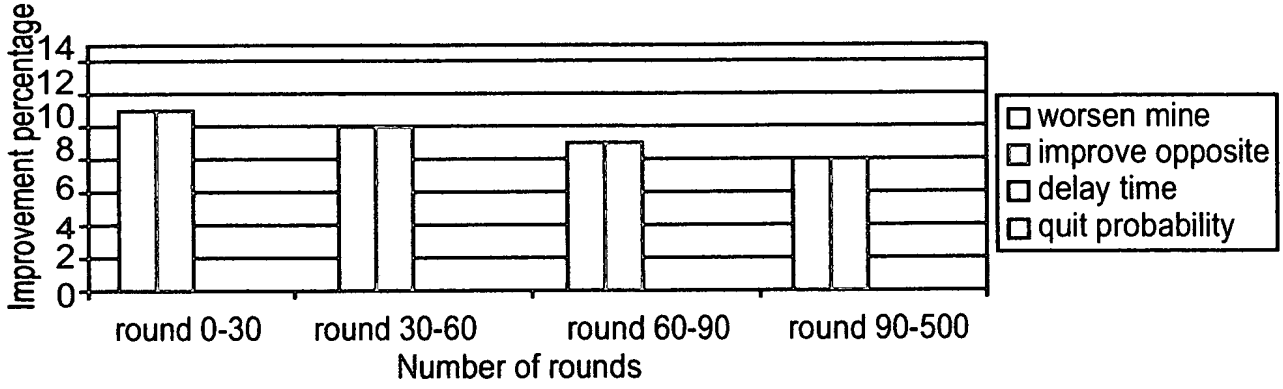


Fig. 36

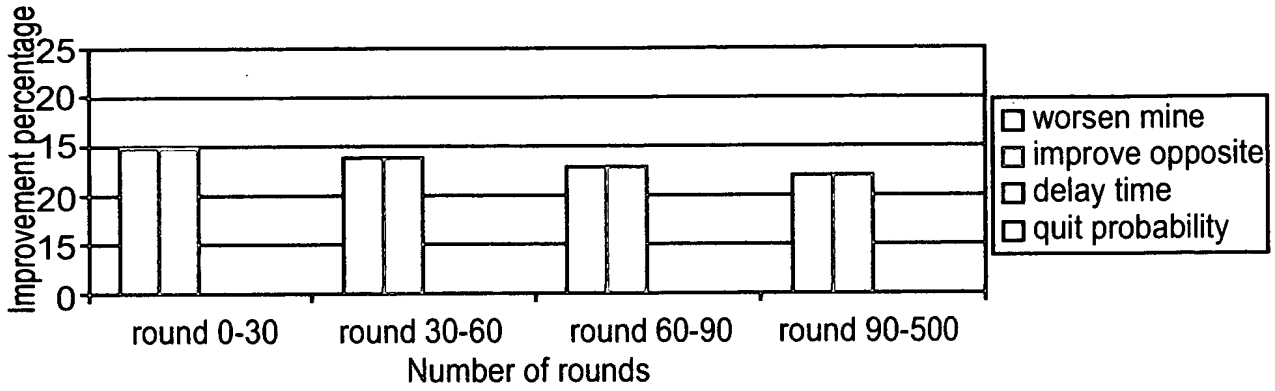

Improvement percentage
25
20
15
20
15
0
round 0-30
round 30-60
round 60-90
round 90-500
Number of rounds
worsen mine
improve opposite
delay time
quit probability

Fig. 37

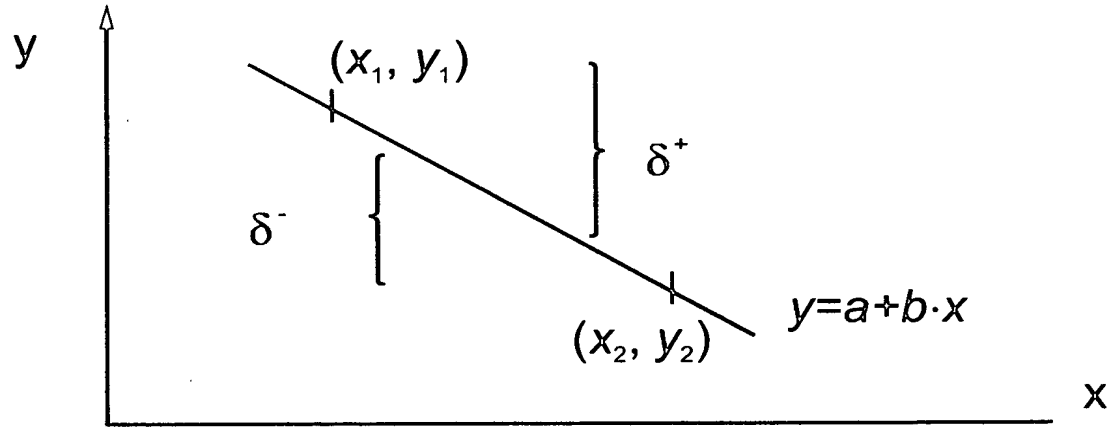

y
(x_1, y_1)
δ^+
δ^-
$y=a+b\cdot x$
(x_2, y_2)
x

Fig. 38

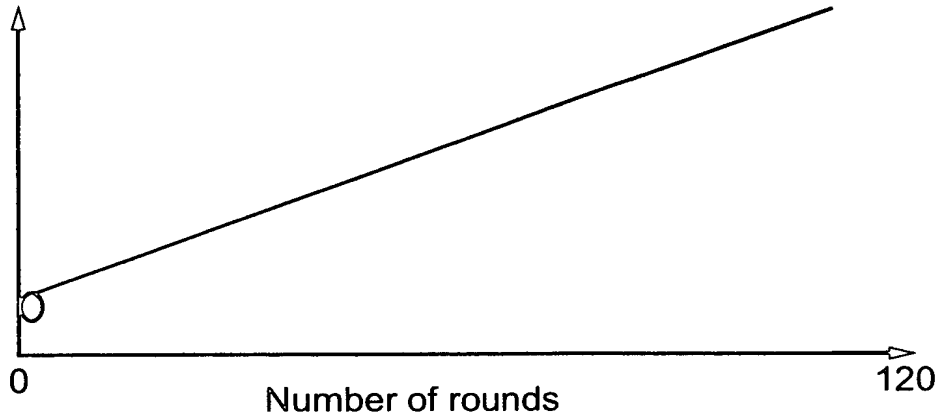

0
120
Number of rounds

Fig. 39

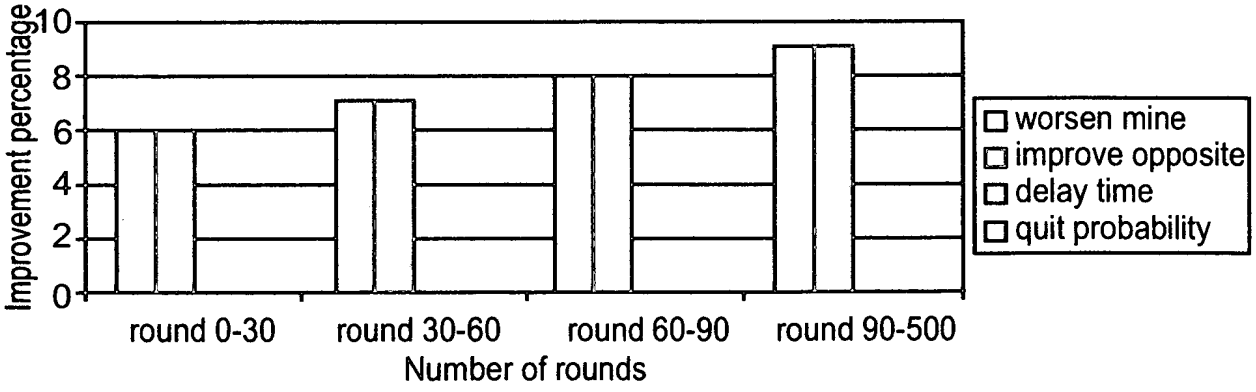

Improvement percentage
10
8
6
4
2
0
round 0-30
round 30-60
round 60-90
round 90-500
Number of rounds
worsen mine
improve opposite
delay time
quit probability

Fig. 40

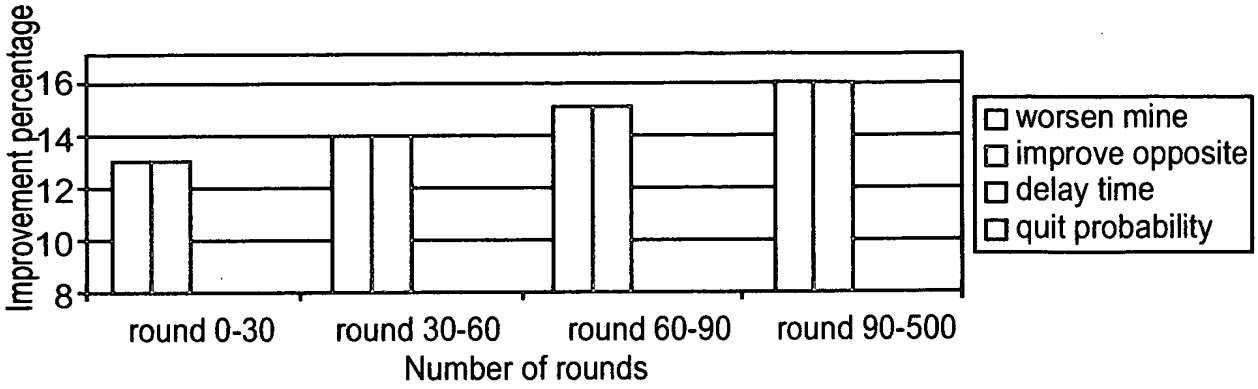


Fig. 41

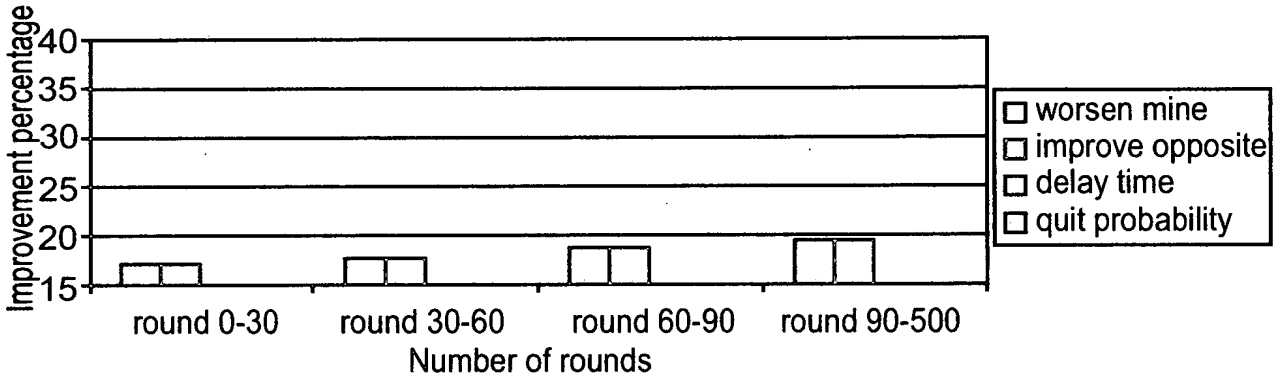


Fig. 42

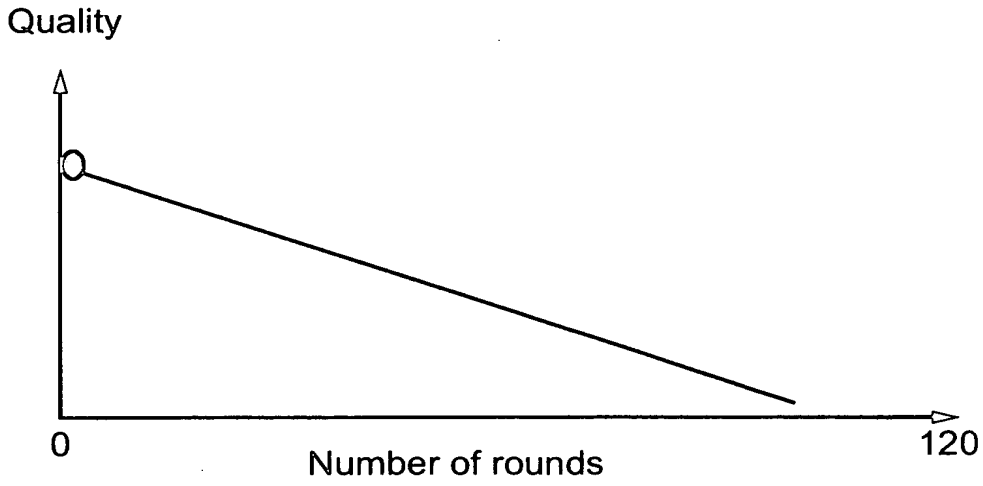
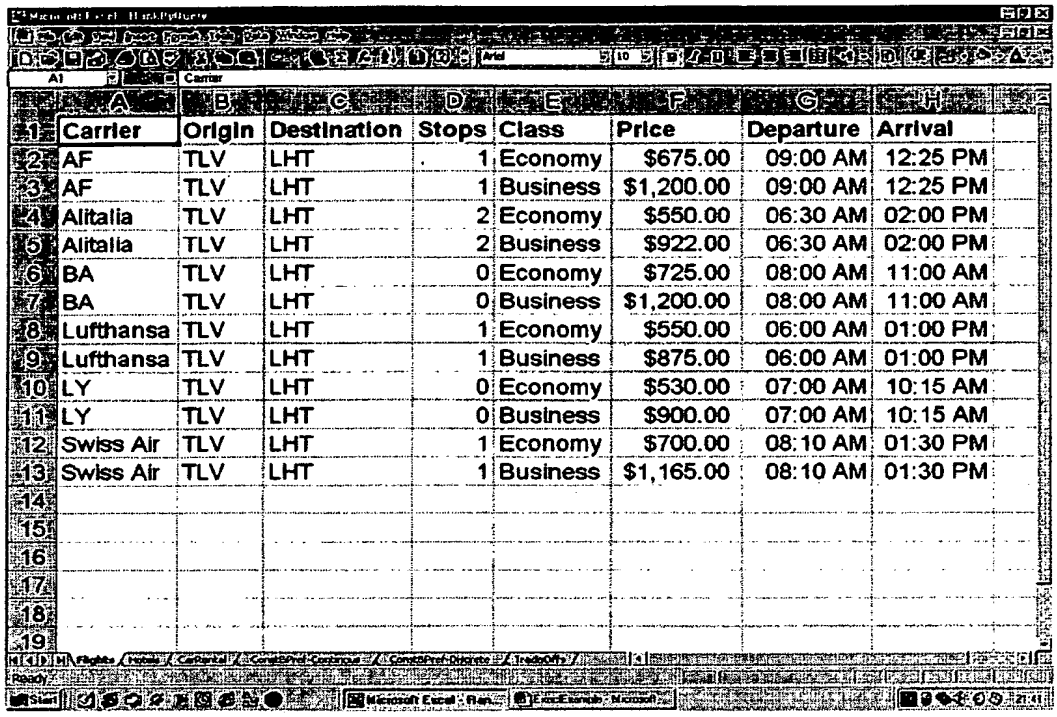


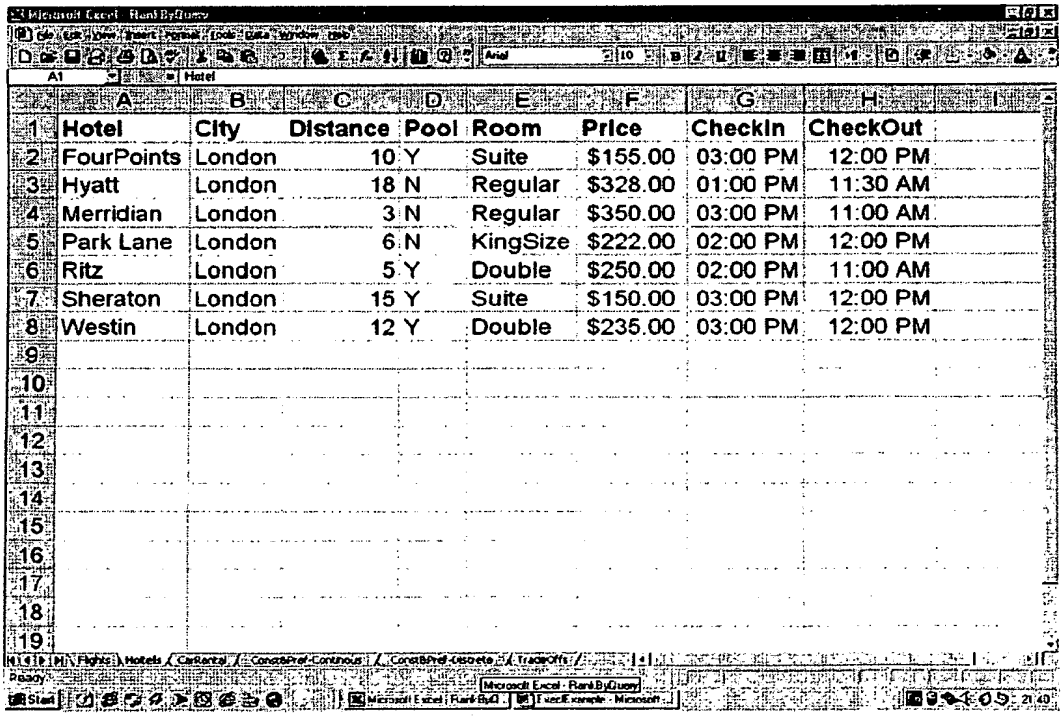
Fig. 43

Flights Table



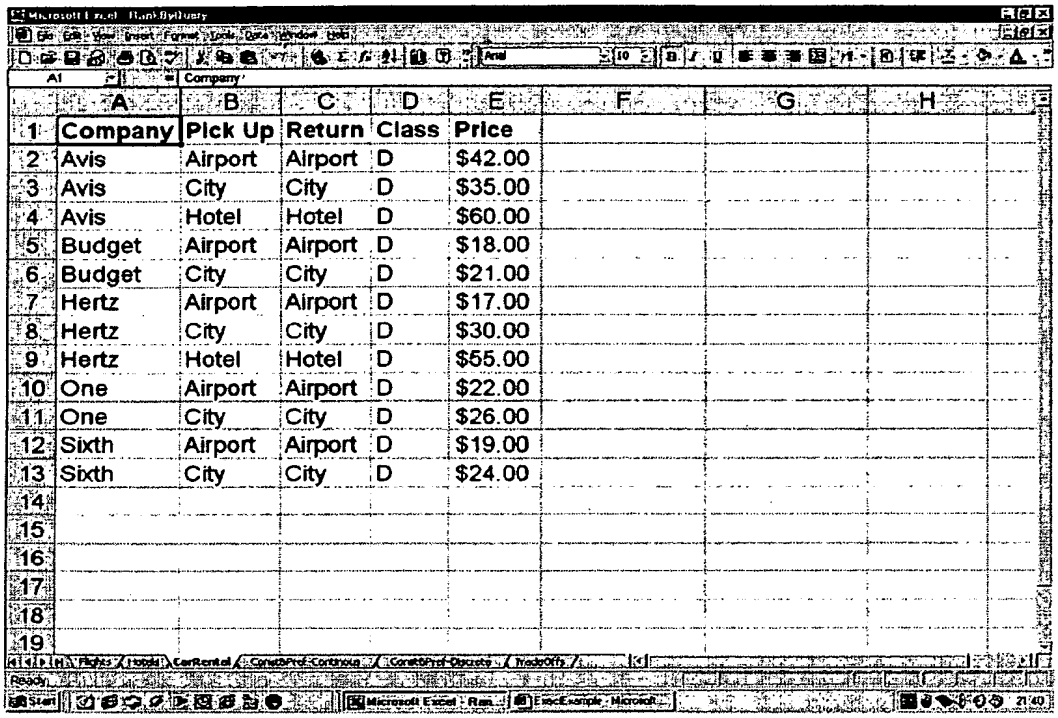
Carrier	Origin	Destination	Stops	Class	Price	Departure	Arrival
AF	TLV	LHT	1	Economy	$675.00	09:00 AM	12:25 PM
AF	TLV	LHT	1	Business	$1,200.00	09:00 AM	12:25 PM
Alitalia	TLV	LHT	2	Economy	$550.00	06:30 AM	02:00 PM
Alitalia	TLV	LHT	2	Business	$922.00	06:30 AM	02:00 PM
BA	TLV	LHT	0	Economy	$725.00	08:00 AM	11:00 AM
BA	TLV	LHT	0	Business	$1,200.00	08:00 AM	11:00 AM
Lufthansa	TLV	LHT	1	Economy	$550.00	06:00 AM	01:00 PM
Lufthansa	TLV	LHT	1	Business	$875.00	06:00 AM	01:00 PM
LY	TLV	LHT	0	Economy	$530.00	07:00 AM	10:15 AM
LY	TLV	LHT	0	Business	$900.00	07:00 AM	10:15 AM
Swiss Air	TLV	LHT	1	Economy	$700.00	08:10 AM	01:30 PM
Swiss Air	TLV	LHT	1	Business	$1,165.00	08:10 AM	01:30 PM

Fig. 44



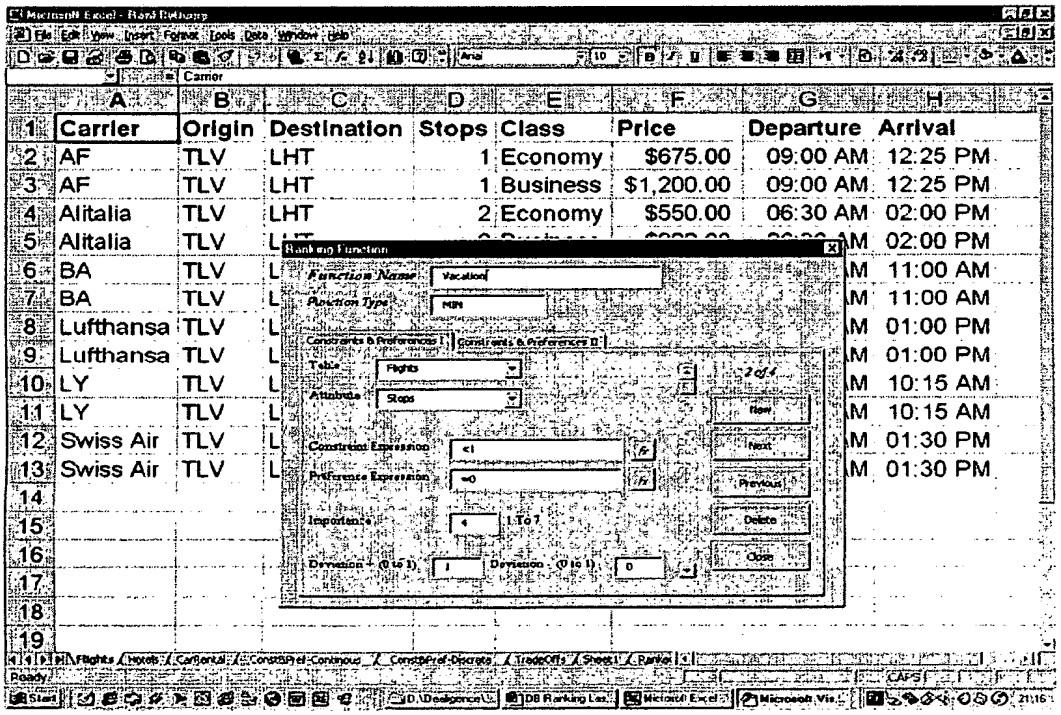
Hotel	City	Distance	Pool	Room	Price	CheckIn	CheckOut
FourPoints	London	10	Y	Suite	$155.00	03:00 PM	12:00 PM
Hyatt	London	18	N	Regular	$328.00	01:00 PM	11:30 AM
Merridian	London	3	N	Regular	$350.00	03:00 PM	11:00 AM
Park Lane	London	6	N	KingSize	$222.00	02:00 PM	12:00 PM
Ritz	London	5	Y	Double	$250.00	02:00 PM	11:00 AM
Sheraton	London	15	Y	Suite	$150.00	03:00 PM	12:00 PM
Westin	London	12	Y	Double	$235.00	03:00 PM	12:00 PM

Fig. 45



	A	B	C	D	E
1	Company	Pick Up	Return	Class	Price
2	Avis	Airport	Airport	D	$42.00
3	Avis	City	City	D	$35.00
4	Avis	Hotel	Hotel	D	$60.00
5	Budget	Airport	Airport	D	$18.00
6	Budget	City	City	D	$21.00
7	Hertz	Airport	Airport	D	$17.00
8	Hertz	City	City	D	$30.00
9	Hertz	Hotel	Hotel	D	$55.00
10	One	Airport	Airport	D	$22.00
11	One	City	City	D	$26.00
12	Sixth	Airport	Airport	D	$19.00
13	Sixth	City	City	D	$24.00

Fig. 46



	A	B	C	D	E	F	G	H
1	Carrier	Origin	Destination	Stops	Class	Price	Departure	Arrival
2	AF	TLV	LHT	1	Economy	$675.00	09:00 AM	12:25 PM
3	AF	TLV	LHT	1	Business	$1,200.00	09:00 AM	12:25 PM
4	Alitalia	TLV	LHT	2	Economy	$550.00	06:30 AM	02:00 PM
5	Alitalia	TLV	L				M	02:00 PM
6	BA	TLV	L				M	11:00 AM
7	BA	TLV	L				M	11:00 AM
8	Lufthansa	TLV	L				M	01:00 PM
9	Lufthansa	TLV	L				M	01:00 PM
10	LY	TLV	L				M	10:15 AM
11	LY	TLV	L				M	10:15 AM
12	Swiss Air	TLV	L				M	01:30 PM
13	Swiss Air	TLV	L				M	01:30 PM

Fig. 47

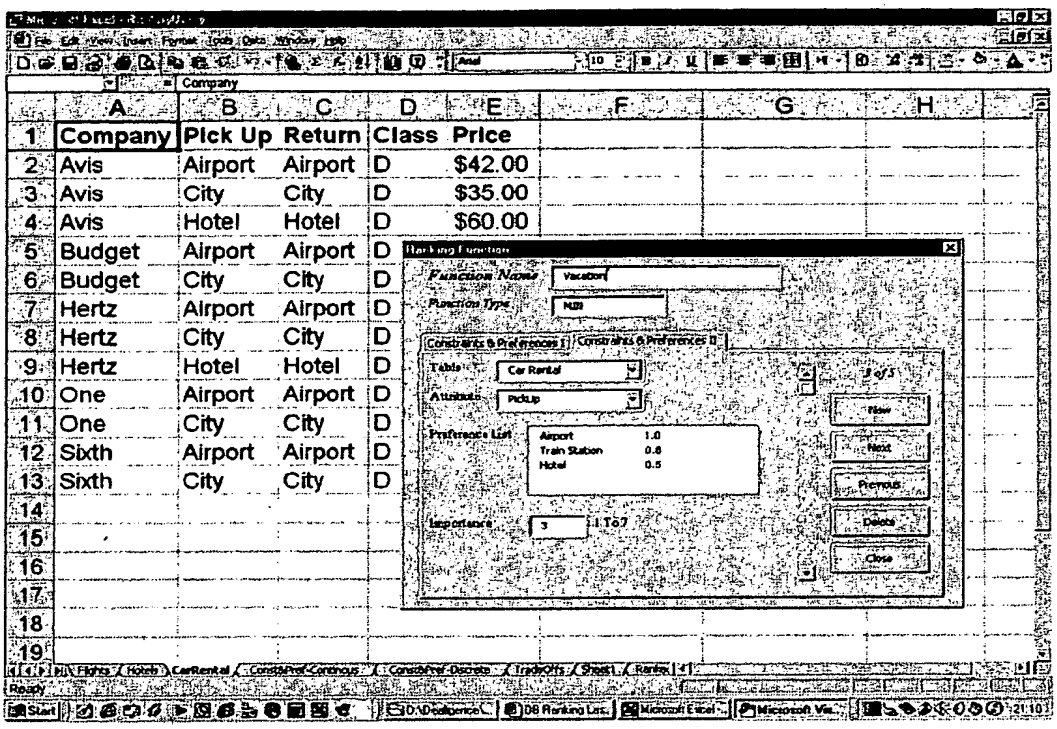

Company
Pick Up
Return
Class
Price
Avis Airport Airport D $42.00
Avis City City D $35.00
Avis Hotel Hotel D $60.00
Budget Airport Airport D
Budget City City D
Hertz Airport Airport D
Hertz City City D
Hertz Hotel Hotel D
One Airport Airport D
One City City D
Sixth Airport Airport D
Sixth City City D
Ranking Function
Function Name
Vacation
Function Type
MIN
Car Rental
Pickup
Airport 1.0
Train Station 0.8
Hotel 0.5
Importance
New
Next
Previous
Delete
Close

Fig. 48

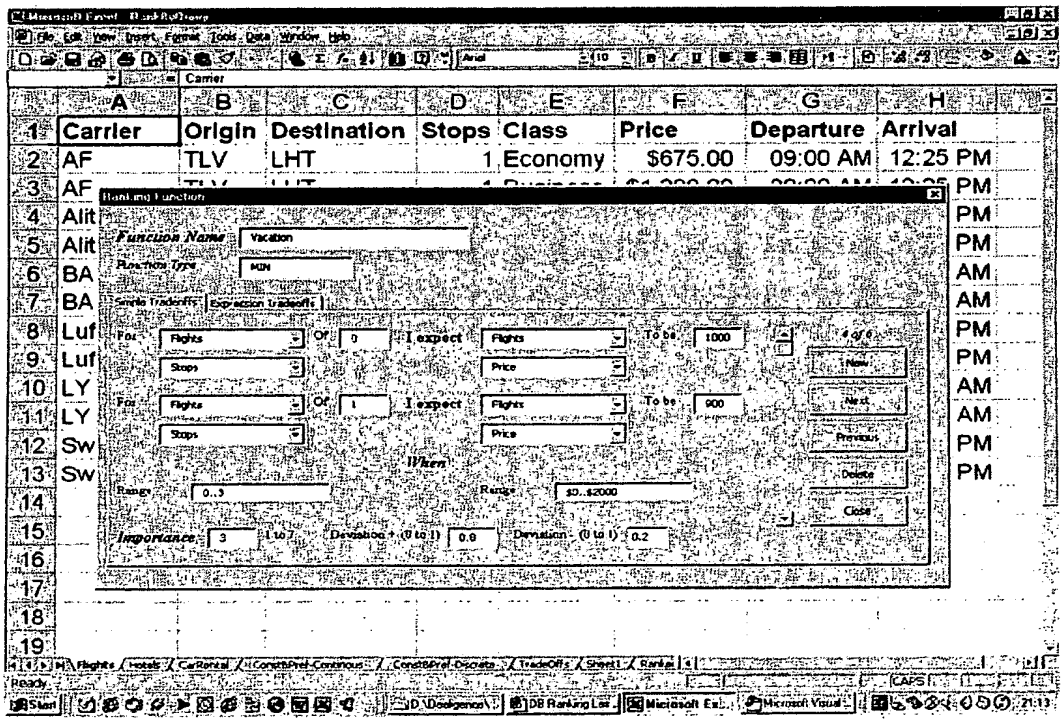

Carrier
Origin
Destination
Stops
Class
Price
Departure
Arrival
AF TLV LHT 1 Economy $675.00 09:00 AM 12:25 PM
Ranking Function
Function Name
Vacation
Function Type
MIN
Importance
New
Next
Previous
Delete
Close

Fig. 49

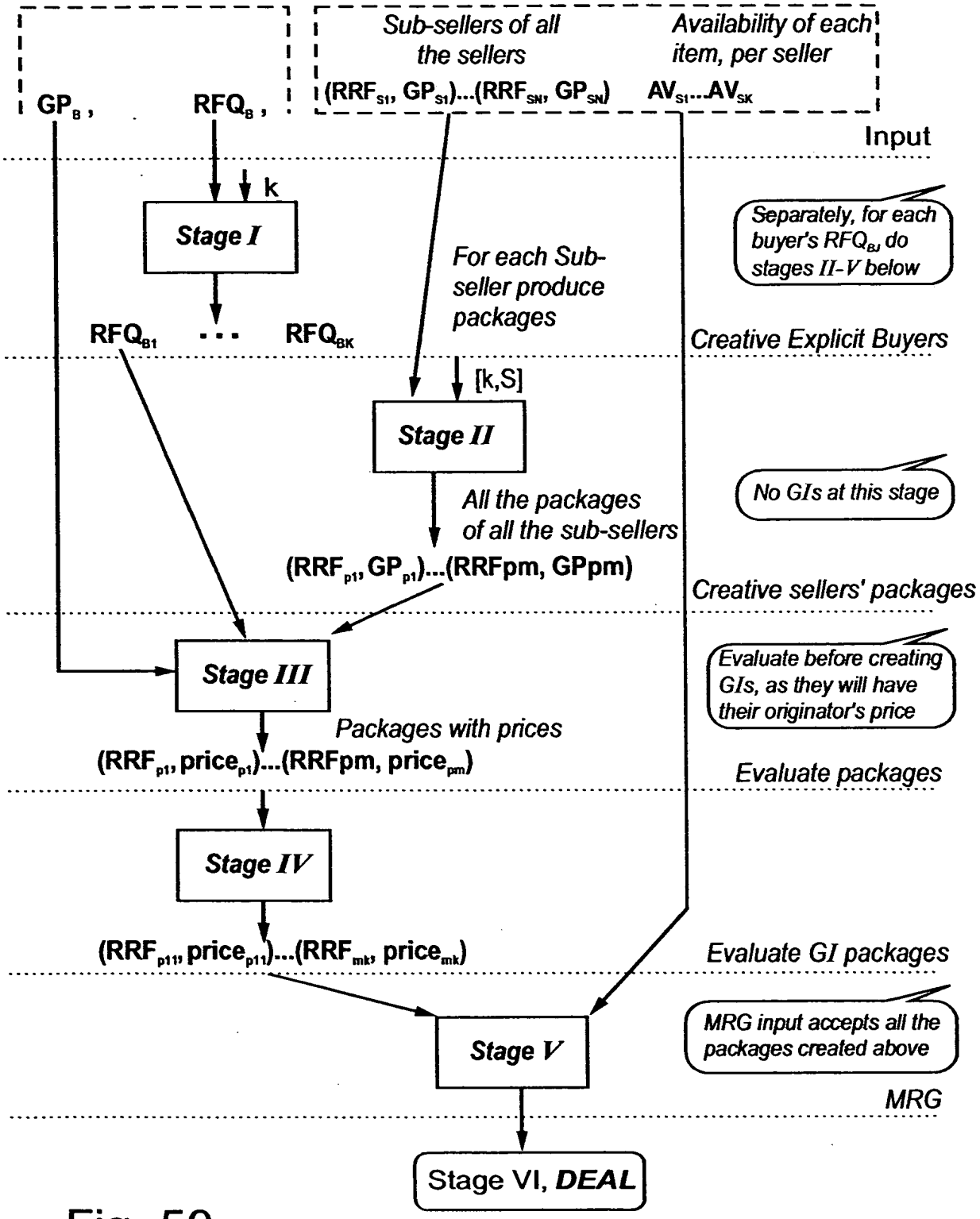

Sub-sellers of all the sellers
Availability of each item, per seller
GP_B , RFQ_B , $(RRF_{S1}, GP_{S1})...(RRF_{SN}, GP_{SN})$ $AV_{S1}...AV_{SK}$
Input
k
Stage I
Separately, for each buyer's RFQ_{Bj} do stages II-V below
For each Sub-seller produce packages
RFQ_{B1} ... RFQ_{BK}
Creative Explicit Buyers
[k,S]
Stage II
No GIs at this stage
All the packages of all the sub-sellers
$(RRF_{p1}, GP_{p1})...(RRFpm, GPpm)$
Creative sellers' packages
Stage III
Evaluate before creating GIs, as they will have their originator's price
Packages with prices
$(RRF_{p1}, price_{p1})...(RRFpm, price_{pm})$
Evaluate packages
Stage IV
$(RRF_{p11}, price_{p11})...(RRF_{mk}, price_{mk})$
Evaluate GI packages
Stage V
MRG input accepts all the packages created above
MRG
Stage VI, DEAL

Fig. 50